STRATEGY OF DISASTER RISK REDUCTION IN THE PERSPECTIVE OF THEMATIC, HOLISTIC, INTEGRATIVE AND SPATIAL 'THIS' APPROACH

(Study at Local Disaster Management Agency
(*Badan Penanggulangan Bencana Daerah*) of Malang Regency)

UNDERGRADUATE THESIS

Submitted to Achieve Bachelor Degree of Public Administration
in Faculty of Administrative Science, Universitas Brawijaya

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MOTTO

"You are what you think.
Be a happy soul."

-Sindi Destiasona-

LETTER OF APPROVAL

Title	: **Strategy of Disaster Risk Reduction in the Perspective of Thematic, Holistic, Integrative and Spatial (THIS) Approach** (Study at Local Disaster Management Agency of Malang Regency)
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Day : Thursday

Date : June, 7th 2018

Time : 11.00 a.m

An Undergraduate Thesis

On behalf of : Sindi Destiasona Shalatdiningrum

Title : **Strategy of Disaster Risk Reduction in the Perspective of Thematic, Holistic, Integrative and Spatial (THIS) Approach** (Study at Local Disaster Management Agency of Malang Regency)

And declare **TO HAVE PASSED**

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PERNYATAAN ORISINALITAS SKRIPSI

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Apabila ternyata di dalam naskah ini dapat dibuktikan terdapat unsur-unsur jiplakan, saya bersedia skripsi ini digugurkan dan gelar akademik yang telah saya peroleh (Sarjana) dibatalkan, serta diproses sesuai dengan Peraturan Perundang-Undangan yang berlaku (UU No. 20 Tahun 2003, Pasal 20 dan Pasal 25 ayat 2).

Malang, 16 Mei 2018

Sindi Destiasona Shalatdiningrum

NIM. 145030101111135

Where I came from and where
my direction always goes.
Family: Bunda, Ayah, Adik.
To you this undergraduate
thesis I dedicated for.

And for those who always have
positive mind, who believe
that process and result are
from the way what we think.

-Sindi Destiasona-

SUMMARY

Sindi Destiasona Shalatdiningrum. 2018. ***Strategy of Disaster Risk Reduction in the Perspective of Thematic, Holistic, Integrative and Spatial 'THIS' Approach*** *(Study at Badan Penanggulangan Bencana Daerah of Malang Regency)*. Undergraduate Thesis. Advisors: Moch. Chazienul Ulum, S.Sos, MPA and Ali Maskur, S.AP, M.AP, MA.

Hyogo Framework Action 2005-2015 and Sendai Framework for Disaster Risk Reduction 2015-2030 that agreed by United Nations member made all the country have to set DRR as the national priority agenda. Indonesia, a country with none of cities are free from disaster threat, has officially made it by legalized the Act No. 24 of 2007 on Disaster Management. Due to fulfill this agenda, a good strategy is absolutely needed. Badan Penanggulangan Bencana Daerah (BPBD) is the agency that has responsibility to execute disaster management in local area.

Malang Regency is a regency that has the highest level of disaster risk in Jawa Timur Province. All disaster potentials are exist on there so it called "Supermarket of Disaster". Along with that issues, in 2016, BPBD Malang Regency was the runner-up of the best disaster agency at national level because of their performance on disaster handling in preparedness, response and rehabilitation. So, that two facts make researcher wants to study about how is their DRR strategy. The strategy is analyzed with Thematic, Holistic, Integrative and Spatial approach, which is the new approach that has been set by Badan Perencanaan Pembangunan Nasional to formulating the work plan of government agency.

This study using descriptive research and qualitative approach with two research focus those are (1) Disaster risk reduction strategy of BPBD Malang Regency; (2) Factor that influence the DRR strategy. The data sources are from informants and documents, with data collection technique through interview and documentation. Data analysis method of this research following Strauss and Corbin model.

The result of this research is DRR strategy of Badan Penanggulangan Bencana Daerah of Malang Regency is thematic, holistic, and spatial, but not integrative yet. Thematic because DRR became the main focus of disaster management strategy. Holistic because it meets all indicators of DRR activities. Spatial because it has interrelatedness between target location and program. Not integrative yet because the funding source is not vary, although the program implementation has involved many stakeholders. The factors that influence DRR strategy implementation are budget commitment, human resources, and cooperation with other parties.

Keywords: Strategy, Disaster Risk Reduction, THIS Approach

RINGKASAN

Sindi Destiasona Shalatdiningrum. 2018. **Strategi Pengurangan Risiko Bencana pada Perspektif Pendekatan 'THIS' Tematik, Holistik, Integratif dan Spasial (Studi pada Badan Penanggulangan Bencana Daerah Kabupaten Malang)**. Skripsi. Dosen Pembimbing: Moch. Chazienul Ulum, S.Sos, MPA dan Ali Maskur, S.AP, M.AP, MA.

Hyogo Framework Action 2005-2015 dan *Sendai Framework for Disaster Risk Reduction* 2015-2030 yang disahkan PBB menetapkan pengurangan risiko bencana sebagai agenda prioritas nasional. Indonesia, negara yang tidak ada satupun daerahnya bebas dari ancaman bencana, telah mewujudkannya dengan mengesahkan Undang-Undang No. 24 Tahun 2007 tentang Penanggulangan Bencana.

Kabupaten Malang memiliki tingkat risiko bencana tertinggi di Provinsi Jawa Timur. Seluruh jenis bencana terdapat di kabupaten tersebut sehingga dijuluki "*Supermarket* Bencana". Kemudian pada tahun 2016, BPBD Kabupaten Malang dinobatkan sebagai BPBD terbaik kedua di tingkat nasional karena kinerjanya dalam mengatasi bencana pada kesiapsiagaan, tanggap darurat dan rehabilitasi. Dua fakta tersebut membuat peneliti ingin mempelajari tentang bagaimana strategi yang dilakukan. Strategi tersebut dianalisis dengan pendekatan Tematik, Holistik, Integratif dan Spasial, sebuah pendekatan yang ditetapkan Badan Perencanaan Pembangunan Nasional untuk merumuskan rencana kerja pemerintah.

Penelitian ini menggunakan jenis penelitian deskriptif dan pendekatan kualitatif dengan dua fokus penelitian yaitu: (1) Strategi pengurangan risiko bencana BPBD Kabupaten Malang; (2) Faktor yang memengaruhi strategi PRB. Sumber data penelitian ini adalah dari informan dan dokumen, dengan teknik pengumpulan data melalui wawancara dan dokumentasi. Metode analisis data yang digunakan adalah model Strauss dan Corbin.

Hasil dari penelitian ini menyatakan bahwa strategi pengurangan risiko bencana BPBD Kabupaten Malang adalah strategi yang tematik, holistik, dan spasial, namun belum integratif. Tematik karena PRB merupakan fokus utama dari strategi. Holistik karena memenuhi semua indikator PRB. Spasial karena terdapat keterkaitan antara target lokasi dan program. Belum integratif karena sumber dana tidak bervariasi, walaupun implementasi program telah melibatkan banyak *stakeholder*. Faktor yang mempengaruhi implementasi strategi PRB adalah komitmen anggaran, sumber daya manusia, dan kerjasama dengan pihak lain.

Kata Kunci: Strategi, Pengurangan Risiko Bencana, Pendekatan THIS

PREFACE

Assalamu'alaikum Wr. Wb.

Praise to Allah SWT, who has given us grace and mercy, so that I, Sindi Destiasona Shalatdiningrum, able to finish this undergraduate thesis entitled "**Strategy of Disaster Risk Reduction in the Perspective of Thematic, Holistic, Integrative and Spatial 'THIS' Approach** (Study at Local Disaster Management Agency of Malang Regency)". This undergraduate thesis as the final assignment to fulfill the requirement for obtain Bachelor Degree of Public Administration in Faculty of Administrative Science in Universitas Brawijaya.

I realize this undergraduate thesis would not be possible without help and support from several parties. Therefore, in this opportunity I would like to thank the honorable:

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For the perfection of this undergraduate thesis, I am very expect the suggestion and positive criticisms. Hopefully, this undergraduate thesis is useful and have meaningful contribution for those in need.

Wassalamu'alaikum Wr. Wb.

Malang, May 11th 2018

Sindi Destiasona Shalatdiningrum

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CHAPTER 1

INTRODUCTION

1.1 Background

Disaster is not a new phenomenon for mankind. The word 'disaster' has been well known and used by human for thousands of years. A disaster is something very bad that happens to people and almost always changes their lives completely. Written by Kusumasari (2014), the trends or development of disaster in the world are: the total number of people affected by disaster is increasing; the cost of the disaster is increasingly expensive; poor countries and poor people are victims of disaster with the greatest impact; the number of disasters increasing each year.

Disaster can cause pain to personal injury, the loss of beloved someone, or anxiety caused by loss of house and future uncertainty. According to the International Bank for Reconstruction and Development (2010: 41-44), the impact of the disaster can last longer on welfare aspects, such as school opportunities, cognitive abilities, and mental health. Even disaster occur suddenly and awhile, it can have long-term consequences: some survivors may feel cornered by circumstances and will not recover as before. Drought for example, especially in the wide area, makes children have growth obstacles and malnutrition with permanent worst effects. According to Coppola (2007) in Kusumasari (2014: 14), disaster causes national and international development efforts to be paused, erased or even regressed; important infrastructure such as roads, bridges, communication systems, airports, electric power, water supply are being damaged and destroyed; damaged school eliminates the opportunity for students to learn; damaged hospitals

increase vulnerability of population; business and economic stability has degradation so it increase unemployment; depression and poverty increase crime and insecurity; increase rates of depression and demotivation to build.

Figure 1.1 Map of Indonesia Disaster Risk Index
Source: Badan Nasional Penanggulangan Bencana, 2013

Unfortunately, according to Indonesia National Agency for Disaster Management, none of regencies/cities in Indonesia are free from disaster threats. Geographically, Indonesia is an archipelago that located at four tectonic plates: Asia continent, Australia continent, Indies Ocean and Pacific Ocean plate. In the southern and eastern part of Indonesia, there is a volcanic arc stretching from Sumatra - Jawa - Nusa Tenggara - Sulawesi, which sides are old volcanic mountains and lowlands, partly dominated by swamps. This condition is very potential but also prone to disasters such as volcanic eruptions, earthquakes, tsunamis, floods and landslides. Indonesia is also located in tropical climate area with two seasons of summer and rain with characteristics of weather changes, temperature and wind direction is quite extreme. Such climatic conditions are combined with various

topography and rock conditions, both physically and chemically, provide fertile soil condition. Vice versa, that condition can also cause some bad consequences such as hydrometeorology disasters like floods, landslides, forest fires and drought. As time progresses and human activity increases, environmental degradation tends to get worse and trigger to increase the number of incidents and intensity of hydrometeorology disasters occurring in many parts of Indonesia.

The data shows that Indonesia is one of the world highest seismic state, more than 10 times level of seismicity in the United States (Arnold in bnpb.go.id). Data of United Nations International Strategy of Disaster Reduction (UNISDR) said, the exposure of population in area who may lose lives due to disaster, the disaster risk faced by Indonesia is very high. Indonesia is in the first rank of 265 countries in the world for the potential of tsunami disaster. The risk of tsunami threat in Indonesia is even higher than Japan. Here is the table of disaster risk in Indonesia:

Table 1.1 Disaster Risk in Indonesia

No.	Disaster Type	Hazard Area (Hectare)	Hazard Area (%)	Impacted People	Impacted People (%)	Physic (Billion IDR)	Economy (Billion IDR)	Environment (Hectare)
1	Flood	39,371,167	21%	100,814,666	40%	176,329,821	140,520,440	12,135,957
2	Flash Flood	2,733,966	1%	8,637,161	3%	44,679,539	15,358,006	1,056,365
3	Extreme weather	106,582,476	56%	244,295,774	96%	11,972,702	3,088,869	-
4	Extreme Waves and Abrasion	1,888,085	1%	4,917,327	2%	22,042,350	1,290,842	460,252
5	Earthquake	52,374,614	27%	86,247,258	34%	466,689,834	182,185,171	-
6	Land and Forest Fires	86,457,259	45%	-	0%	-	59,036,830	41,856,289
7	Drought	163,101,784	86%	228,163,266	89%	-	192,737,143	63,781,004
8	Volcanic Eruption	394,324	0%	749,126	0%	2,695,427	12,613	139,676
9	Landslide	57,418,460	30%	14,131,542	6%	78,279,825	75,870,343	41,337,707
10	Tsunami	961,133	1%	3,702,702	1%	71,494,821	7,976,358	119,688

Source: Badan Nasional Penanggulangan Bencana, 2016

Other numbers mentioned by *Aksi Cepat Tanggap Foundation* which is the non-governmental organization that concern in social and humanity are:

> "148.4 million Indonesians living in earthquake-prone areas. Then another 5 million residents are in tsunami-prone areas along the West Coastline of Sumatra, South Coastline of Jawa-Bali until the islands along Nusa Tenggara Barat and Nusa Tenggara Timur. In addition, another 1.2 million people living in volcano-prone areas. Most surprising than other natural disasters possibility, there are about 63.7 million Indonesians living in flood-prone areas. While 40.9 million living on landslide-prone areas."
> (act.id, March 5th, 2017).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Geology	76	126	141	292	840	840	356	325	317	634	545
Hidrometereology	539	679	979	830	1129	1299	1299	1516	1431	1362	1156

Figure 1.2 Number of Indonesia Disaster in 2005-2015
Source: Badan Nasional Penanggulangan Bencana, 2016

The table above shows that the number of disaster incidents in Indonesia is not little with the graph of up and down each year. As a human being, we cannot prevent and stop the number of disaster. However, we can reduce the risk before the disaster actually happens so that the impact is not so big. Like the statement of UNISDR (2002), disaster risk reduction is a systematic approach that identifies, assess and reduces disaster risk with the aim to reduce socio-economic vulnerability to disaster and addressing hazards that create vulnerability. Disaster risk reduction is very important to reduce the hazard of physical, social and economic vulnerability to disaster so it can minimize the effect of disaster.

According to Indiyanto and Kuswanjono (2012: 25-30) in relation to disaster risk reduction, disaster losses can be minimized if disaster can be forecasted and predicted how is the damage. A destructive natural phenomenon will not be a very tragic disaster if the community has readiness. Casualties and/or material losses due to disaster actually shows the unpreparedness of individuals, communities, and institutions in the face of disaster risk. So the disaster actually shows something that does not work well in disaster risk management.

Disaster risk reduction is a basic of disaster management. It relates to activities and steps taken before the disaster happen to ensure effective response of hazard impacts, including an effective early warning. Thus, preparedness and the arrangement of programs to address potential disruptions to physical and social systems is one of the main foundation of disaster management (Godschalk in Kusumasari, 2014).

This natural event is not separated from the victim. Disaster still a scientific mystery that comes unpredictable, so the most anticipation is the process of disaster anticipation and minimize the consequences of disaster. In addition, what is not less important is disaster risk reduction. According to Rahmat in Purnomo & Sugiantoro (2010: 93), the purposes of risk reduction are to: prevent the loss of life; reduce the human suffers; inform the public and stakeholders about risks; reduce the damage of infrastructure, property and loss of economic resources; and speed the recovery.

Cities will grow, especially in developing countries. Our lives and property will be increasingly exposed to disaster, although the rate is not same. Although the level of exposure will increase, the better-managed cities can reduce the vulnerability and level of risk. Although we are not directly managing the city, we

can control many aspects of our lives and can do much to reduce new risks. The next generation will face more difficult issues, but they will find it helpful from what steps we take now.

Although it is not a new discourse and practice, there are some moments that mark the strengthening of disaster risk reduction agenda in the world. Namely, a decade of international action at the World Conference on Disaster Risk Reduction in Hyogo, Japan, it was decided Hyogo Framework for Action (HFA) 2005-2015. The conference was held by United Nations International Strategy for Disaster Reduction (UNISDR). HFA has a strong force because it argues that disaster is a threat that can destructs the development outcomes that have been achieved by developed countries and especially developing countries (UNISDR, 2012). The priority actions of HFA 2005-2015 are: 1) ensure disaster risk reduction as a national and local priority; 2) identify, assess and monitor disaster risk and improve early warning; 3) utilize knowledge, innovation and education to build resilience; 4) reduce the underlying risk factors; 5) strengthen disaster preparedness for effective response.

After Hyogo Framework for Action 2005-2015, there is Sendai Framework for Disaster Risk Reduction, which is the framework of disaster risk reduction from World Conference on Disaster Risk Reduction held in Sendai, Japan on March 2015. This worldwide conference is a special opportunity for countries to: 1) adopt the framework for disaster risk reduction after 2015 that concise, targeted, forward-looking and action-oriented, and 2) identify modalities in collaboration and conduct periodic reviews based on discussion, also review of Hyogo Framework for Action implementation. The priority actions of Sendai Framework are: 1) understanding

disaster risks; 2) strengthening governance and institutions in disaster risk management; 3) investing resilience in economic, social, cultural and environmental; 4) increasing preparedness, response and recovery at all levels.

The Government of Indonesia recognizes that Indonesia is highly vulnerable to disaster, the important decisions taken by Government of Indonesia in disaster management are the Act Number 24 of 2007 on Disaster Management, Government Regulation Number 21 of 2008 on Disaster Management and President Regulation Number 8 of 2008 on National Disaster Management Agency. Act Number 24 of 2007 makes fundamental paradigm is change, which disaster management tended to emergency response, shifted to the awareness of disaster risk reduction and management.

Provinsi	Kabupaten/ Kota Prioritas	Indeks Risiko	Tingkat Risiko	Struktur Ruang
BANTEN	Tangerang	200.8	TINGGI	PKN Jabodetabekjur
BANTEN	Cilegon	182.4	TINGGI	PKN
DI YOGYAKARTA	Kota Yogyakarta	124.8	SEDANG	PKN
DI YOGYAKARTA	Sleman	153.6	TINGGI	PKW
DKI JAKARTA	DKI Jakarta	123.3	SEDANG	PKN Jabodetabekjur
JAWA BARAT	Kota Bogor	107.2	SEDANG	PKN Jabodetabekjur
JAWA BARAT	Kota Depok	102.4	SEDANG	PKN Jabodetabekjur
JAWA BARAT	Bekasi	164.8	TINGGI	PKN Jabodetabekjur
JAWA BARAT	Cianjur	250	TINGGI	PKN Jabodetabekjur
JAWA BARAT	Kota Bandung	154	TINGGI	PKN Bandung Raya
JAWA BARAT	Bandung Barat	162	TINGGI	PKN Bandung Raya
JAWA BARAT	Cirebon	181.2	TINGGI	PKN
JAWA BARAT	Sukabumi	231.2	TINGGI	PKW
JAWA BARAT	Tasikmalaya	224.8	TINGGI	PKW
JAWA BARAT	Ciamis	215.2	TINGGI	PKW
JAWA BARAT	Pangandaran	215.2	TINGGI	PKW
JAWA TENGAH	Kota Semarang	183.6	TINGGI	PKN Kedungsepur
JAWA TENGAH	Kendal	167.2	TINGGI	PKN Kedungsepur
JAWA TENGAH	Demak	183.6	TINGGI	PKN Kedungsepur
JAWA TENGAH	Cilacap	215.2	TINGGI	PKN
JAWA TENGAH	Kebumen	203.2	TINGGI	PKW
JAWA TENGAH	Magelang	143.2	SEDANG	PKW
JAWA TIMUR	Malang	219.2	TINGGI	PKN
JAWA TIMUR	Gresik	175.2	TINGGI	PKN Gerbangkertosusila
JAWA TIMUR	Bangkalan	164.4	TINGGI	PKN Gerbangkertosusila
JAWA TIMUR	Kota Surabaya	166.8	TINGGI	PKN Gerbangkertasusila
JAWA TIMUR	Sidoarjo	149.6	TINGGI	PKN Gerbangkertosusila
JAWA TIMUR	Lamongan	174	TINGGI	PKN Gerbangkertosusila
JAWA TIMUR	Bojonegoro	150	TINGGI	PKW
JAWA TIMUR	Pacitan	215.2	TINGGI	PKW
JAWA TIMUR	Banyuwangi	219.2	TINGGI	PKW
JAWA TIMUR	Jember	219.2	TINGGI	PKW

Figure 1.3 National Priority Areas of Java
Source: Badan Nasional Penanggulangan Bencana, 2016

The table above shows that Malang Regency is included as the regency of national priority in disaster management. Malang Regency on the first rank as the highest disaster risk area in Jawa Timur province with the risk index is 219.2 and belongs to high-risk level. Malang Regency also in the sixth rank position of National Disaster Risk Index as reported by *Radar Malang*, "From the calculation of Indonesia Disaster Risk Index by National Disaster Management Agency (BNPB), we entered the top six in national. Well, Malang Regency belongs to the most disaster-prone area in Jawa Timur." explained by Head of Badan Penanggulangan Bencana Daerah of Malang Regency, Hafi Lutfi (radarmalang.id, April 2nd, 2017).

Beside the high of disaster risk index, the number of disasters in Malang Regency is big and tends to increase each year, as shown in the figure below:

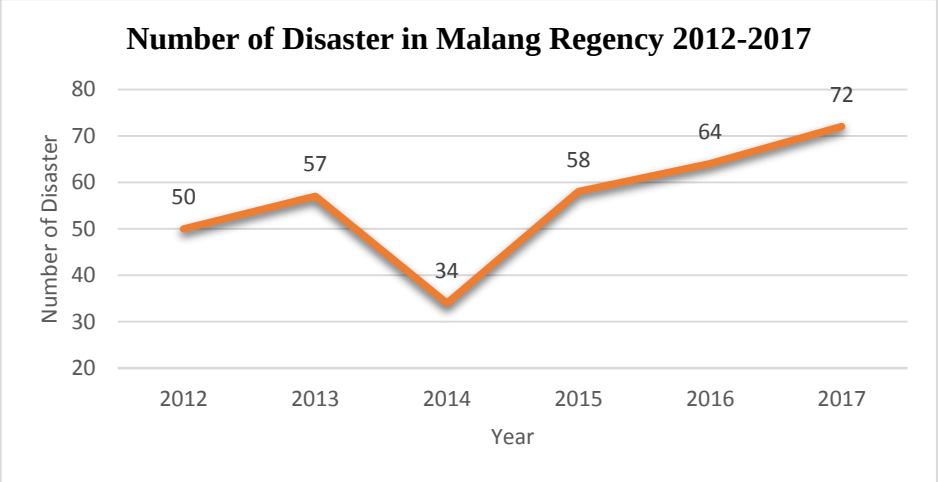


Figure 1.4 Number of Disaster in Malang Regency 2012-2015
Source: Adapted from Renstra BPBD Malang Regency 2016-2021 and beritajatim.com, 2017

The figure shows that from 2012 until 2017, number of disaster in Malang Regency tends to increase, although it decreased in 2014. During six months in 2017, from January to July, there have been 72 natural disasters in Malang Regency.

Many potentials of disaster type in Malang Regency, so Malang Regency usually called "supermarket of disaster", because all disaster has high potential to occur in this regency.

As the area with the highest disaster risk in Jawa Timur, Malang Regency, of course, has a strong determination in disaster risk reduction agenda. Explained by *Surya Malang*, in 2016, Malang Raya area (Malang City, Malang Regency and Batu City) became the pilot project of disaster risk reduction by United States Agency for International Development (USAID) through Climate Change Adaptation Program and Resilience (APIK).

Badan Penanggulangan Bencana Daerah of Malang Regency as the main leading sector in disaster management is the best agency in Jawa Timur province and runner-up in national level. Reported by *Times Indonesia* magazine, that award was given during national coordination meeting of all Badan Penanggulangan Bencana Daerah (BPBD) of Indonesia, on February 24th, 2016 in Jakarta. In general, the award is given because of the preparedness, rehabilitation, reconstruction, also handling during and after the disaster. That news also have been explained by Staff of BPBD Malang Regency, "Yes indeed in 2016 BPBD Malang Regency was awarded as the best BPBD in Jawa Timur. It is because of our maximum performance in the face of such a great disaster, ranging from pre-disaster, emergency response and post-disaster." - Interview with Pak Indra, staff of Preparedness Subdivision, March 6th, 2018.

The disaster risk reduction agenda is one of international, national and provincial joint agenda participation. More details, attention the following figure:

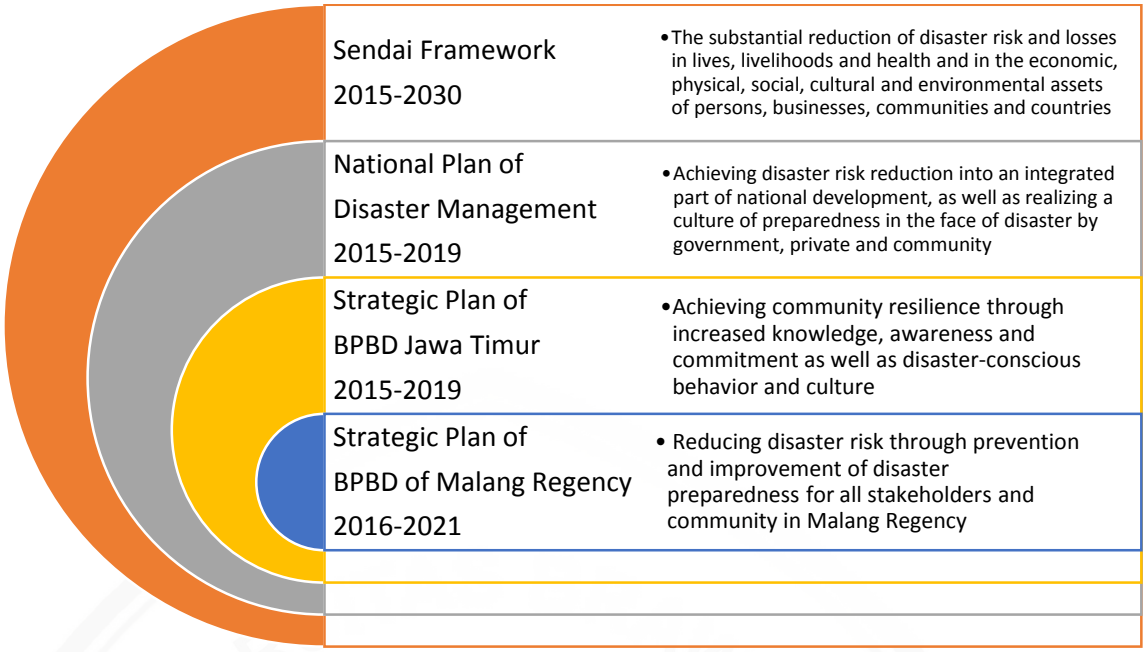


Figure 1.5 Roadmap of Disaster Risk Reduction
Source: Processed by Researcher, 2017

Disaster risk reduction in Malang Regency is regulated in Local Regulation Number 4 of 2011 article 31 letter b. The article stated that disaster risk reduction is undertaken to reduce adverse impacts, especially in the situation where there is no disaster by conduct disaster recognition and assessment activity, understand the community vulnerability, analysis of potential disaster impacts, options for disaster risk reduction action and determine disaster preparedness and response mechanisms.

Based on all description above, it can be understood that disaster risk reduction is an important action that needs to be concerned how is the development. In line with UNISDR that reduce the exposure of hazards, reduce the vulnerability of human and physical, management of land and environment, and improve the preparedness and early warning for the worst condition are the examples of disaster risk reduction activities. The government through Badan Penanggulangan Bencana Daerah of Malang Regency, of course, needs a

strategy to making it happen. Disaster risk reduction includes planning how major risks will be identified, managed and then reduced. Therefore, the strategy of disaster risk reduction and specific action should be included in the plan, or disaster risk reduction will only a discourse (National Research Council of USA, 2005).

The strategic plan discusses what and why of a program, but its implementation discusses who, where, when, and how it is running. To identify that, National Development Planning Agency (Bappenas) has set new approach of development planning. The Government Performance Plan 2017 determines that development planning is implemented with holistic, thematic, integrative and spatial (THIS) approach to improve the effectiveness and efficiency of the national priority agenda targets. In relation with that, all policies and government performance must conform to that approach.

All description above explains that disaster risk reduction becomes an international agenda within 2015-2030. At the same time, it is known that the disaster risk level in Malang Regency is the highest in Jawa Timur province that following up by disaster risk reduction agenda undertaken by government through Badan Penanggulangan Bencana Daerah of Malang Regency. As the runner-up position of local disaster management agency in the national level, the researcher wants to describe and analyze how is the strategy of disaster risk reduction by Badan Penanggulangan Bencana Daerah of Malang Regency in the perspective of thematic, holistic, integrative and spatial approach. The result of this research is expected to be an alternative of existing material and could give

a contribution of study what are the factors that influence disaster risk reduction strategy by Badan Penanggulangan Bencana Daerah of Malang Regency.

1.2 Problem Formulation

Based on the background that has been described above, the researcher sets the problem formulation those are:

1. How is the strategy of disaster risk reduction by Badan Penanggulangan Bencana Daerah of Malang Regency in the perspective of thematic, holistic, integrative and spatial approach?
2. What are the factors that influence disaster risk reduction strategy by Badan Penanggulangan Bencana Daerah of Malang Regency?

1.3 Purpose of Research

Based on the problem formulation that have been determined, the purposes of this research are:

1. To know, describe and analyze the strategy of disaster risk reduction by Badan Penanggulangan Bencana Daerah of Malang Regency in the perspective of thematic, holistic, integrative and spatial approach
2. To know, describe and analyze the factors that influence disaster risk reduction strategy by Badan Penanggulangan Bencana Daerah of Malang Regency.

1.4 Contribution of Research

Based on the research purposes, the researcher divides the research contribution into academic and practical, as follows:

1. Academic Contributions
    a. The result of this study are expected to be used as a contribution of thought to know the implementation of disaster risk reduction strategy by Badan Penanggulangan Bencana Daerah of Malang Regency in the perspective of thematic, holistic, integrative and spatial approach
    b. As a reading material and reference for further research on strategy of disaster risk reduction by Badan Penanggulangan Bencana Daerah of Malang Regency.
2. Practical Contributions
    a. As input and consideration material about strategy of disaster risk reduction by Badan Penanggulangan Bencana Daerah of Malang Regency in the perspective of thematic, holistic, integrative and spatial approach
    b. This research is expected to be an illustration for government in reviewing strategy of disaster risk reduction by Badan Penanggulangan Bencana Daerah of Malang Regency.

CHAPTER 2

LITERATURE REVIEW

2.1 Prior Research

Prior research becomes one of the researcher's references to enrich the theory that used to discuss in this research. Here is the prior research from several journals related to research that conducted by the researcher:

Table 2.1 Prior Research

No	Identity of Journal Article	Research Method	Findings
1.	Disaster Risk Management at Gunung Padang Cultural Heritage Area, Ciamis, West Java Sudibyakto & Priatmodjo Journal of Disaster Research Indonesia Vol 2 No 1 May 2016	Descriptive Qualitative	The result of this research is Gunung Padang cultural heritage area is prone to earthquake and landslide disaster. The vulnerability to the earthquake disaster in this region is classified as high category and the vulnerability to landslide disaster is classified as a moderate category. With moderate vulnerability and low disaster management capacity, the risks of earthquake and landslide disasters are categorized as high. A disaster risk reduction plan that should be immediately pursued in the Gunung Padang Site Area is a non-structural disaster risk reduction accompanied by sectoral planning covering four sectors: management and coordination, health, infrastructure and logistics.
2.	Strategy of Flood Disaster Risk Reduction through Disaster Risk Management in Sungai Penuh City Fadillah & Darwin	Mix method	The result of analysis shows: 1) The flood disaster index in Sungai Penuh city consists of 3 high-risk sub-districts: 1 medium-risk sub-district, and 4 low-risk sub-districts. 2) Need improvement of Disaster Risk Management that currently runs without integrated coordination. Vertical coordination works well but not for horizontal coordination, cross-provincial

	Proceedings of Regional and City Planning, Islamic University of Bandung, 2016		assistance comes faster than Jambi Province itself. 3) DRM strategy to reduce flood risk is a Weakness-Opportunity strategy (turn-around strategy), one of that is utilize the program between SKPD into an integrated program, optimizing the role of NGOs-community-government in an integrated communication system.
3.	Strategy of Local Government in Flood Disaster Management in Bantaeng District Nasyiruddin, et al Journal of Governmental Science, Muhammadiyah University of Makassar Vol. V No. 2 October 2015	Descriptive Qualitative	The result of the research indicates that the construction of reservoir conducted by Bantaeng Local Government has been done; reforestation carried out as water absorption from upstream (mountain) areas to reduce the amount of flow of water discharge to the downstream area; the development of the coastal wall as a breakwater in coastal areas has not been well implemented; provision of facilities and infrastructures to support the achievement of programs such as the construction of reservoirs, greening and constructing coastal walls; increase public awareness in flood prevention is still not good.
4.	Reflections On The Uptake of Climate Change Policies by Local Governments: Facing The Challenges of Mitigation and Adaptation Hoppe, et al SpringerOpen Journal 2014, 4:8	Comparative Case Study	Most Dutch municipalities have local climate change policies that address mitigation. Local government pays relatively little attention to adaptation. The difference is mostly due to the take-up of central government policy support schemes aimed at the vertical integration of climate change mitigation policies. Moreover, mitigation is typically framed as an 'energy' issue whereas adaptation is framed as a 'water' issue. This has far-reaching consequences. Climate change adaptation has never been prioritized, nor has it been supported by properly funded policy support schemes. In the realm of local climate change policies, adaptation is still considered an 'add-on' to climate change mitigation

			policy. Moreover, adoption and implementation of both adaptation and mitigation rejected institutional changes in Dutch local policy practice.
5.	Integrating Health Into Disaster Risk Reduction Strategies: Key Considerations for Success Dar, et al American Journal of Public Health, October 2014, Vol 104, No. 10	Descriptive Qualitative	Integrating health into disaster risk reduction is a global health priority and should feature increasingly in high-level policy discussions. But several factors frequently prevent the full and sustained integration of health into national disaster risk reduction strategies. These factors include: 1) inadequate financing 2) insufficient knowledge base 3) complex and varied bureaucratic and governance structures within countries, and 4) limited interdisciplinary interaction between health and other sectors. Agreement on a comprehensive process framework for integrating health into disaster risk reduction would help accelerate and sustain the progress already being made. Increasing the visibility and understanding of this concept within the health sector and with other partners in disaster risk reduction is a key step in that process.
6.	PhotoVoice: A Community-Based Participatory Approach in Developing Disaster Reduction Strategies Crabtree & Braun Healthcare Association of Hawaii, Emergency Services; April 2014	Descriptive Qualitative with Photovoice Project	Forty-two vulnerabilities and 50 capabilities within the community were identified and then categorized through photo presentations and discussion sessions. These were sorted into 17 themes, including communications, accessibility, historic and cultural, emergency notification, food, and water. Based on the vulnerability and capability assessment, 13 gaps were identified and discussed, yielding 11 feasible strategies to reduce the community's vulnerability. The strategies were prioritized by the group into a plan of action are: 1) Develop a master tsunami emergency operations plan; 2) Develop and implement the emergency notification strategy; 3) Conduct more training and exercises;

			4) Work with community to clearly establish responsibilities and improve coordination; 5) Develop pre-established emergency roles for rapid response; 6) Establish two-way communication access at the evacuation site; 7) Rewire and store the 100kw generator at evacuation site; 8) Implement awareness strategy; 9) Implement food strategies; 10) Complete tsunami evacuation signage; 11) Implement fuel strategies. PhotoVoice was found to be a successful community-based participatory process to assist a vulnerable community to develop contextually appropriate disaster reduction strategies through visual dialogue, which increased community awareness, engagement, and capacity.

Source: Processed by Researcher from Sudibyakto & Priatmodjo (2016); Fadillah & Darwin (2016); Nasyiruddin, et al (2015); Hoppe, et al (2014); Dar, et al (2014); Crabtree & Braun (2014)

In this research, the researcher study about how is the strategy has been applied by government in reducing disaster risk. From prior research, the researcher do not find any same title as the title of the researcher's. However the researcher raised several studies on the same topic as references to enrich the study material on the researcher's.

Based on prior research that researcher select above, can be seen there are similarities and differences with research do. What makes this research more exclusive is that researcher raise the theme of government strategy in general, not specializing in a particular disaster, so that later, the result of this research analysis can be used as a reference for others related to how is the disaster risk reduction strategy in the perspective of thematic, holistic, integrative, and spatial approach.

2.2 Development Administration

The beginning of development administration cannot be separated from the public administration (Ngusmanto, 2015: 50). Development administration is part of perspective in the social science that discusses about development. According to Tjokroamidjojo (1997) in Ngusmanto (2015: 50), development administration uses two elements: 1) the formulation of state policies and 2) the preparation of instruments for policies implementation in order to achieve the development goals effectively. This means that development administration contributes to policy formulation as well as implementing the policy itself. The main task of government in developing country is related to policy and decision making to manage public resources, directing activities and motivating the community, providing services, and providing protection to improve the life quality of community.

According to Tjokroamidjojo (1997) in Ngusmanto (2015: 53), development administration is an administration for social development that dynamic, innovative and seek to change the various aspects of community life through various mobilization and allocation of resources for development activities. The statement can be simplified that development administration is an attempt to achieve a better state by involving mutually supportive aspects.

Besides to policy setting, Tjokroamidjojo also argued about the importance of a program. Tjokroamidjojo (1997) in Ngusmanto (2015: 53) argued that policy needs to be supported by concrete development programs rather than the project plan poured into the project form. After implementing the program, the organization conducts an evaluation to know exactly whether the achievement of result, progress

and constraints can be analyzed and studied for the improvement of the implementation of future development plans.

Development administration as a grand theory that researcher choose to support this research. There is a link between the concept of development administration and disaster risk reduction. The importance of natural disaster as a consideration in designing development strategy, more particularly in sustainable development, was recognized by United Nations since the 1990s as the beginning of the International Decade for Natural Disaster Reduction (IDNDR). This resolution support disaster into development initiatives by stipulating that member of United Nations should established a national disaster risk reduction program. The United Nations Commission on Sustainable Development (UNCSD) stated that sustainable development with international instruments aimed at reducing poverty and preserving the environment cannot be succeed without measure the risks of natural hazards and their impact (National Research Council of USA 2006).

Disaster that occur cannot be separated from the failure of incorporate factors and potential of disaster risk reduction into the mainstream of development planning and policy. In some extents, disaster occurs because of our failure to conduct disaster risk reduction activities that lead to increase vulnerability to disaster risk. We must begin to create a development design that incorporate systematic assessment of disaster risks to minimize the impact of disaster.

2.3 Concept of Disaster Management

2.3.1 Disaster

The definition of disaster in United Nations - International Strategy for Disaster Reduction (UNISDR, 2002: 24) is “a serious disruption of the function of community or society that causing losses of human, material, economic and wide environment which exceed the ability of affected community/society to cope its own resources”.

While the definition according to Act Number 24 of 2007, the disaster is event or series of events that threaten and disturb people's life and livelihoods that caused by natural and/or non-natural factors or human factors so create human casualties, environmental damage, property losses, and psychological impact."

Based on the above definitions of UN-ISDR and Act Number 24 of 2007 can be generalized that to call "disaster" must meet the criteria / condition as follows: 1) There is an event; 2) Occurs due to natural factor or human activities; 3) Occur suddenly but can also occur gradually; 4) Cause loss of fatalities, property, socio-economic loss, environmental damage and others; 5) Exceed the community's ability to cope.

According to Act Number 24 of 2007, disaster based on its causes consists of natural disaster, non-natural disaster, and social disaster, each of those has the following meanings:

1. Natural disaster is disaster caused by event or series of events caused by nature such as earthquake, tsunami, volcano, flood, drought, hurricane, and landslide;
2. Non-natural disaster is disaster caused by event or a series of non-natural events such as fires, disease outbreak, technological failure;

3. Social disaster is a human-caused disaster such as social conflict between groups and terrorism.

Although the type of disaster are three, but in this research the term of disaster refers to natural disaster. Because Badan Penanggulangan Bencana Daerah of Malang Regency only take responsibility of that kind of natural disaster.

If observed, disaster is due to an interaction between hazards and vulnerabilities, also there are triggers. So it can be described as follows:

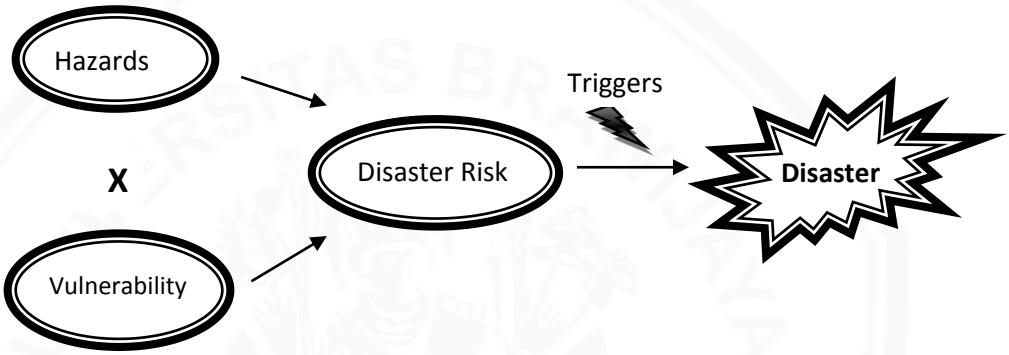


Figure 2.1 Process of Disaster Occurrence
Source: Nurjannah, et al, 2012

From the figure can be explained that the disaster occurs through the process and meet the following elements:

1. Hazard

   Hazard is a natural or artificial phenomenon that has the potential to threat human life, loss of property and environmental damage.

2. Vulnerability

   The vulnerability is a condition of a community that leads or causes an inability to deal with a hazard. The level of vulnerability is an important thing to know as one of the factors that affect the occurrence of disaster because a new disaster will occur if "hazard" occurs in "vulnerable condition".

The level of vulnerability can be assessed from physical, social and economic vulnerabilities. Physical vulnerability describes a physical condition that is vulnerable to certain hazard factors such as built area presentation, building density, emergency construction presentation, power grids, road length ratio, telecommunication network, waters and rail networks. Social vulnerability describes the condition of social vulnerability level in the face of hazard. Economic vulnerability describes a condition of economic vulnerability in the face of hazard such as the percentage of poor households.

According to United Nations Disaster Relief Organization (UNDRO) as quoted by Nurjannah et al (2012: 22) there are several factors that influence the occurrence of vulnerability, namely: 1) dangerous location, 2) poverty, 3) urbanization, 4) damage and degradation of environmental quality, 5) large population growth, 6) cultural change and 7) lack of information and awareness.

3. Disaster risk

Disaster risk is the possibility that raised by disaster. The size of risk is determined by the level of vulnerability. If people are familiar with disaster and its characteristics, also the ability to handle the disaster, then the vulnerability level of the community is low.

4. Trigger

Trigger is external factor that makes the potential of hidden threats become more real. For the example, long-lasting rainfall in an area will increase the possibility of flood and landslide.

5. Disaster

Based on some definitions of disaster above, it can be concluded that disaster is a crisis situation that disrupts all aspects of community life both physically, socially and economically. Disaster occurs because of the encounter of external threats to human life and vulnerability.

2.3.2 Disaster Management

Disaster management is defined as a collective term that include all aspects of planning to respond disasters, including pre-disaster and post-disaster activities that may also refer to risk management and disaster consequences (Shaluf in Purnomo and Sugiantoro, 2010: 19). Disaster management involves plans, structures, and arrangements made by government, volunteer and private sector efforts in a coordinated and comprehensive manner to respond to all emergency needs. Therefore, disaster management consists of all the planning, organizing, and mobilization of resources needed to handle all phases of disaster as unique natural events (Kelly in Purnomo and Sugiantoro, 2010). According to Act Number 24 of 2007 on Disaster Management, the implementation of disaster management is a series of efforts include the establishment of development policies that have risk of disaster, disaster prevention activity, emergency response and rehabilitation. Some definitions above about disaster management can be concluded that disaster management is the whole process of planning, organizing and regulation-making in response to disasters, including pre-disaster until post-disaster activities which involve government, volunteer and private sector in a comprehensive manner.

According to Act Number 24 of 2007, the principles of disaster management are: fast and precise; priority; coordination and coherence; efficient and effective;

transparency and accountability; partnership; empowerment; non-discriminative; and non-proletariat. This Act also described that disaster management aims to provide protection to community from the threat of disaster; harmonize existing legislation; ensure the implementation of disaster management in a planned, integrated, coordinated and comprehensive manner; appreciate local culture; build the public and private participation and partnership; encourage the spirit of mutual cooperation, solidarity, and generosity; create peace in people's live; environmental sustainability; usefulness and effectiveness; and the scope of area.

The paradigm of disaster management (Ahdi, 2014: 63) includes:

1. Emergency Assistance, focusing on disaster through the providing of food, shelter, and health services. The main goal is to alleviate the suffering of victims, prevent widespread destruction and to speed the recovery.
2. Mitigation, focusing on understanding of disaster prone areas and behavior pattern of vulnerable individual/community. The objective of mitigation is done through make building structures, resettlement, regulation of building and spatial arrangement.
3. Development, focusing on the causative factors and the process of vulnerability of society. The main objective is to improve the capacity of community in various non-structural aspects such as poverty alleviation, improving the quality of life, land ownership, access to capital and technological innovation.
4. Risk Reduction, focusing on disaster risk analysis, threats, vulnerability and community capacity. The main objective is to improve capability in order to manage and reduce risk and also reduce the disaster. This is done jointly by all stakeholders through community empowerment.

The current disaster management paradigm in Indonesia has moved in the phase of risk reduction paradigm. Following the Hyogo Framework for Action 2005, United Nations member are expected to establish a disaster risk reduction program as a national action plan. Then Act Number 24 of 2007 on Disaster Management proves that Indonesia has implemented disaster risk reduction paradigm in response to disaster, so that the focus is pre-disaster action.

Act Number 24 of 2007 describes the implementation of disaster management consists of five stages are as follows:

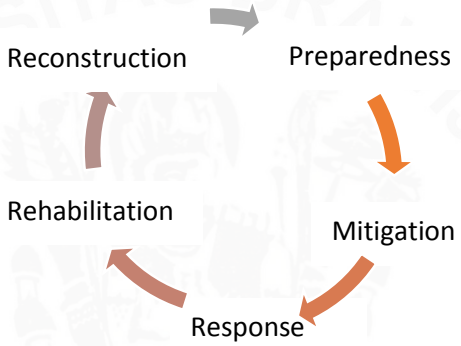


Figure 2.2 Disaster Management Cycle
Source: Processed by Researcher from Act Number 24 of 2007

1. Preparedness

   A series of activities in disaster potential situation that are undertaken to anticipate disaster through appropriate and efficient ways.

2. Mitigation

   Action taken before the disaster occur with the aim of reducing or eliminating the impact of disaster on the community and environment by physical development as well as awareness and enhancement of the ability to deal with disaster threat.

3. Response

   The disaster response begin as soon as it becomes clear that the disaster will occur and continue until the emergency is declared over. A series of immediate activities when disaster happen, including the rescue and evacuation of victims, property, basic needs, protection, refugee management, and recovery of facilities and infrastructure.

4. Rehabilitation

   The improvement and recovery of all aspects of public service to an appropriate level in the post-disaster area with the main objective to normalize all aspects of governance and community life in the post-disaster area.

5. Reconstruction

   The reconstruction of all infrastructures and facilities, institutions in the post-disaster area, both at the government and community levels with the main objectives to develop the economic, social and cultural activities, the establishment of law and order, and the rise of community participation in all aspects of community life in the post-disaster area.

2.4 Concept of Disaster Risk Reduction

2.4.1 Disaster Risk

Act Number 24 of 2007 explains that disaster risk is potential of loss caused by the disaster in a certain area and period of time which bring the death, injury, illness, threatened live, loss of security, displacement, damage or loss of property, and disturbance of community activities. Disaster risk is the interaction between the level of vulnerability and hazard. The threat of natural hazard is permanent because of earth's surface condition both internal and external power. While the level of

regional vulnerability can be reduced, so the ability to face the threat is increasing. Thus, the greater hazard, vulnerability and disability, the risk of disaster is greater.

According to Maarif (2012: 177), philosophically to face the hazard of disaster can be done by:

1. Keep the hazard and risk away from human. Exception, hazard of an earthquake or volcanic eruption, it is difficult or even impossible.
2. Keep people away from hazard and risk. This method is called relocation, can be done but with the right social approach.
3. Live harmony with hazard and risk. In this case, we must recognize the character of nature, in order we can adjust every behavior of nature.
4. Learn from experience, society is always trying to get the wisest way to fight, avoid and adapt the hazard and risk.

Furthermore, Maarif (2012: 178) stated that almost every country or community seeks to build its resilience to face the disaster around it. Similarly, Indonesia which is located in a very disaster-prone area also does the same thing. Talking about the society resilience in the face of disaster, it cannot be separated from the ability that society has. Society ability to minimize hazard, reduce vulnerability and increase capacity. According to Ahdi (2014: 67), to build a resilient community in facing a disaster, the community must improve the ability in four things, namely 1) Ability to anticipate any hazards that will occur; 2) Ability to fight or avoid the disaster hazard; 3) Ability to adapt disaster and its impacts; 4) Ability to recover quickly from a disaster.

2.4.2 Disaster Risk Reduction

The concept of disaster risk reduction focusing on the analysis of disaster risk, threat, vulnerability and community capacity. The main objective is to improve skills in order to manage and reduce risks and also the consequences of disasters. Disaster risk reduction is a systematic approach that identify, asses and reduce

disaster risks with the aim of reduce socio-economic vulnerability and address vulnerable hazard (UNISDR, 2002).

Disaster risk reduction focusing on empower individuals and community in dealing with disaster to minimize the impact of disaster so that people have the capacity to survive and rise if disaster occur. In addition, as contained in Sendai Framework for Disaster Risk Reduction 2015-2030, the expected outcome of this effort is a significant reduction of losing casualties, social, economic and environmental assets in the affected areas.

The steps taken in disaster risk management in the pre-disaster phase are as follows:

1. Recognize the hazard that surround the house
2. Identify risks based on probability of disaster and its intensity and impact
3. Analyze the types of high-risk hazards from some types exist
4. Manage risks by prevention (risk avoidance), mitigation (risk reduction), and move some risks (risk transfer)
5. Accept the hazard (risk acceptance) but the community must be alerted
6. After all these steps are passed, continuously monitor the development of hazards and society vulnerability to anticipate the effort of capability development
   (quoted by Nurjannah et al., 2012: 47).

Meanwhile, disaster risk reduction as referred in Act Number 24 of 2007 article 35 is conducted to reduce the worst impact that may arise, especially in a situation where there is no disaster. The activities are as follows:

1. Disaster risk recognition and monitoring
2. Participatory planning of disaster management
3. Development of disaster awareness
4. Increase commitment to disaster management behavior
5. Implementation of physical, nonphysical, and disaster management efforts.

Act Number 24 of 2007 Article 36 stated that disaster management planning is established by the central and regional government in accordance with their

authority. Disaster management planning is done through the preparation of disaster risk data in a certain area within a certain time based on the official disaster management program. Article 36 paragraph (4) stated that disaster management planning include: 1) introduction and assessment of disasters; 2) understanding of society vulnerability; 3) analysis of potential disaster impact; 4) options for disaster risk reduction action; 5) determination of disaster preparedness and response mechanism; and 6) allocation of tasks, authorities and available resources.

2.5 Local Government

Local government is the executor of local governance. By decentralization, local government is given the authority to manage its own regional affairs. Local government refers to administrative authorities in a smaller area of a country, as described in Act Number 32 of 2004 on Local Government, local government is the governor, regent or mayor and local apparatus as element of local government administration.

According to Jimung in Prastyan (2017: 11) local government is part of central government based on the Law that runs the government, elected by community of the area and equipped with the authority to make regulation, provide services to the community in their power. Researcher can conclude that the local government in certain area hold the power and authority of local administration. In this case are Governor, Regent or Mayor in each region such as province, district and city as autonomous regions have wider authority in the government administration, therefore must be able to rationally determine the best for the region.

Governance is the way in which society manage their affairs in the economic, political and social spheres. It comprises values, policies, institutions and mechanisms for implementation, and it involves interactions between the state, civil society and the private sector. In the case of disaster risk reduction, effective governance should include DRR as policy priority, allocating sufficient resources to it, ensuring effective implementation and facilitating participation by all relevant stakeholders (Twigg: 2015: 73).

Government is divided by function, hierarchy and politic, all of which can work against sustained risk management. Government agencies have a legitimate role in disaster management, including civil protection organization, scientific research institution, environmental protection agencies and finance ministry. Simply coordinating these may be a major task.

Government plays some roles in DRR according to Twigg (2015: 73):

1. As providers of DRR goods and services (e.g. maintaining early warning systems, emergency response services, evacuation shelters, hospitals)
2. As risk avoiders (e.g. ensuring investments in public infrastructure and facilities, such as roads or schools, are protected against environmental hazards)
3. As regulators of private sector activity (e.g. creating and enforcing building codes and land use regulation)
4. As promoters of collective action and private sector activity (e.g. public education about preparedness and business continuity)
5. As coordinators of multi-stakeholder activities and DRR partnerships.

Decentralization has positive consequences for risk reduction. Sharing responsibilities between central, intermediate and local levels of government helps to mainstream DRR across government structures, as well as giving local levels a greater sense of ownership. Decentralisation can also change how communities and local NGOs interact with state institutions. Being closer to the communities involved, staff in local organisations of all kinds are more likely to understand or even share their needs, and they are more accountable.

2.6 Concept of Strategy

In running an organization both public and private, there must be systematic step or method that have been established in the implementation of all organizational activities. The step and method itself is the set of policies that described in the form of strategy. The strategy is made as the initial planning in the implementation of organization activities in order to achieve goals effectively and efficiently. According Siagian (2008: 17) strategy is a large-scale planning that oriented to the time scope and implemented in such a way in order to enable the organization interact effectively then direct to optimize the achievement of organizational goals. Meanwhile, according to Sedarmayanti (2004: 220), strategy is the determination of basic long-term goals and organizational objectives, the implementation of actions and resources allocation, it is important to implement the target. The strategy is a set of basic or critical choices about the purpose and way of an activity. It illustrates that strategy is a dynamic process, it means strategy is an action to deal with change and different environmental condition and a way to create opportunities and face hazards.

Based on the definition above, can be conclude that strategy is a stage plan in the form of policy that arranged with careful consideration to overcome a particular problem or to achieve organizational goals. Strategy is an action of change that done through policymaking by a leader to achieve the goal or solve a certain problem include certain action, reasonable consideration, usage of available resources effectively and effort to reach a long-term target.

The strategy is implemented as a further step in planning that will be run in order to achieve organizational goals. Determination of strategy cannot be separated with activities to be achieved in the future. Implicitly, some of the benefits of strategy are as follows: (Siagian, 2008: 206-209)

1. Be an effective way to implement activities in order to achieve the goals that have been set.
2. Clarify the meaning of a plan through the identification of more specific details of how the organization should manage the areas in the future.
3. As a guidance of activity implementation in various fields.
4. Be able to know concretely and clearly about various ways to achieve development goals and priorities in those areas based on its capabilities.
5. Facilitate coordination for all parties to have equal participation and perception about interaction, interdependence, and interrelation that must be maintained in managing the running of an organization so that it will reducing or even eliminating the possibility of conflict between the various parties concerned. Thus the strategy can run as expectation.
6. As a series of decision-making process in solving various problems.

According to Wit and Meyer in Udaya (2013: 6), the strategy should be viewed and understood in three dimensions:

1. Strategy process, is the way in which strategies emerge. This strategy concern how the strategy should be created, analyzed, formed, formulated, implemented, modified and controlled, who is involved, and when the activities are carried out.

2. Strategy content, is the outcome/product of the strategy process. If expressed as a question, this strategy relates to what and how the content should be.
3. Strategy context, is a set of circumstances from various strategy process and strategy content. This strategy is related to where and in what environment the strategy is.

All three are real dimensions and not a separate part of strategy. Thus, each strategy basically has three dimensional nature with characteristic of process, content, and context. In a good strategy there is coordination of teamwork, has a theme, identify the influence factors in accordance with the principle of implementation, efficiently in funding and have tactics to achieve goals effectively. The theory of strategy dimension by Wit and Meyer become the focus of the author to analyze disaster risk reduction strategy of Badan Penanggulangan Bencana Daerah of Malang Regency.

The theory of strategy dimension is relate with the new approach of development planning by Badan Perencanaan Pembangunan Nasional. In the document of Government Performance Plan 2017 stipulated that development planning is implemented with Thematic, Holistic, Integrative and Spatial approach to improve the effectiveness and efficiency of national priority agenda objectives. Written in the guidebook of Regional Development Performance Evaluation by Badan Perencanaan Pembangunan Nasional (2017: 29-33) and linked to disaster risk reduction strategy, the explanation of four approaches are as follows:

1. Thematic

   Keyword of thematic approach is policy related to disaster risk reduction being the focus or emphasis in the planning document. This condition is marked by

the number of program in the planning document related to disaster risk reduction. The document is the Work Plan and Strategic Plan of Badan Penanggulangan Bencana Daerah of Malang Regency.

2. Holistic

   Keyword of holistic approach is policy related to disaster risk reduction prepared thoroughly and comprehensively in the Work Plan and Strategic Plan of Badan Penanggulangan Bencana Daerah of Malang Regency. Disaster risk issues are so complex and inter-related so that it is necessary to identify the causal factors and indicators that indicate the disaster risk in a region. Therefore, to analyze the accuracy of disaster risk reduction strategy can be done by looking at whether the programs have answered the factors that cause high disaster risk. The more critical factors are answered, the strategy can be summed up as a holistic strategy.

3. Integrative

   Keyword of integrative approach is the integration of actors and funding sources. Once the disaster risk reduction strategy is analyzed with a thematic and holistic approach, then the strategy needs to be more technically identified into who is the implementator and the funding source used. It should be identified whether the strategy has involved all stakeholders. The more stakeholders involved and the more varied sources of funding that support it, the strategy can be summed up as an integrative strategy.

4. Spatial

   Keyword of spatial approach is the interrelatedness of location and various integrated activities. This means that every program that is structured with

thematic, holistic and integrative approach have functional relationship. Activities that are functionally planned for their location should be related to each other in a unified territory and inter-regional linkages. If the location of programs are interlinked and mutually supportive in one area point, the disaster risk reduction strategy can be summed up as a spatial-based strategy.

The researcher uses these four approaches as an analysis tool of disaster risk reduction strategy because the approach is the rule that established by Badan Perencanaan Pembangunan Nasional for planning and evaluation of government performance which expected to be made as information in development. The researcher linked the development planning approach to the theory of strategy dimensions by Wit and Meyer. There is a relationship and core similarity of description between strategy dimension theory by Wit and Meyer with development planning approach by Badan Perencanaan Pembangunan Nasional. These three strategy dimensions can be easily interpreted using the thematic, holistic, integrative and spatial approach which is indeed a regulation to all government.

CHAPTER 3

RESEARCH METHOD

3.1 Type of Research

The purpose of this research is to describe the strategy of disaster risk reduction by Badan Penanggulangan Bencana Daerah of Malang Regency, so the ideal type of research that researcher applies to achieve that purpose is descriptive research type. Generally, descriptive research is research that aims to describe and summarize any condition, situation and variable that arise in research location (Bungin, 2014). While the researcher applies qualitative approach as the approach method in this research. As stated by Greenhalgh and Taylor (2013), qualitative approach seeks a deeper truth. Its aim to study things in their natural setting, attempting to make sense of, or interpreting phenomena in terms of the meanings people bring to them, and it uses a holistic perspective which preserves the complexities. The used of descriptive research method with the qualitative approach in this research aims to explain the real phenomena strategy of disaster risk reduction by Badan Penanggulangan Bencana Daerah of Malang Regency.

3.2 Focus of Research

The focus of research is the initial scope that used as the research area so that researcher will get an overall picture of the situation to be studied. Determination of research focus is also as an effort to prevent refraction in describe and discuss the problems. The focus is basically the main problem that comes from the researcher experience or the scientific literature (Moleong, 2014: 97). According to Moleong (2014: 94), in guidance and direction of focus, researcher

knows exactly which data and what data is needed to collect and also what data may be interesting but irrelevant, which do not need to be included in data collection process.

The limitation in this research is disaster risk reduction strategy that will be analyzed with the supporting theory. Based on the description and adjusted to the problem formulation, research focus that used in this study are:

1. The strategy of disaster risk reduction by Badan Penanggulangan Bencana Daerah of Malang Regency in the perspective of thematic, holistic, integrative and spatial approach, as follows:
   a. Thematic

      Keyword of thematic approach is policy related to disaster risk reduction being the focus or emphasis in the planning document. This condition is marked by programs in the planning document related to disaster risk reduction.

   b. Holistic

      Keyword of holistic approach is policy related to disaster risk reduction prepared thoroughly and comprehensively in the strategy. The more critical factors are answered, the strategy can be summed up as a holistic strategy.

   c. Integrative

      Keyword of integrative approach is the integration of actors and funding sources. The more stakeholders involved and the more varied sources of funding that support it, the strategy can be summed up as an integrative strategy.

d. Spatial

Keyword of spatial approach is the interrelatedness between the location with various integrated activities. Activities that are functionally planned for their location should be related to each other in a unified territory and inter-regional linkages.

2. Factors that influence the strategy of disaster risk reduction by Badan Penanggulangan Bencana Daerah of Malang Regency as follows:
   1) Budget Commitment
   2) Human Resources
   3) Cooperation with Other Parties

3.3 Location and Site of Research

Moleong (2014: 128) stated that location of research is where the researcher do research, especially in capture the phenomenon or the real event of research object with the aim to obtain accurate research data. The best way to determine research location is to consider substantive theories and field surveys to find out the conformity with reality. The location of this research is in Malang Regency. The site of this research is Badan Penanggulangan Bencana Daerah of Malang Regency. The reason why the researcher choose Malang Regency as the location and site of this research because according to Indonesia Disaster Risk Index 2016, Malang Regency has the highest disaster risk in Jawa Timur Province, and according to the 2016 national coordination of Local Disaster Management Agency in Indonesia, Badan Penanggulangan Bencana Daerah of Malang Regency is the national runner-up agency in disaster management that include preparedness, rehabilitation, reconstruction, also handle during and after disaster.

3.4 Source of Data

Because the research method used is descriptive research type with qualitative approach, researcher grouping data that able to represent the research result. Then the source of data used in this research as follows:

1. Informant

   Determine the informant in this study is conducted using purposeful sampling technique. Purposeful sampling technique used by the researcher to select individual and place to be studied because they could specifically give an understanding of the research problem and phenomena in the study (Cresswell, 2015: 217). Purposeful is also applied to conduct data triangulation to find valid data. Researcher determines the informants in this study are:

   a. Pak Joni, as Head of Prevention and Preparedness Division of Badan Penanggulangan Bencana Daerah of Malang Regency
   b. Pak Indra, as Staff of Preparedness Subdivision of Badan Penanggulangan Bencana Daerah of Malang Regency
   c. Bu Aan, as Staff of Planning and Evaluation Subdivision of Badan Penanggulangan Bencana Daerah of Malang Regency

2. Document

   The document used to complete and confirm the truth of the data that obtained from the informants, as follows:

   a. Profile of Badan Penanggulangan Bencana Daerah of Malang Regency
   b. Strategic Plan of Badan Penanggulangan Bencana Daerah of Malang Regency 2016-2021
   c. Disaster Management Plan of Malang Regency 2015-2019
   d. Region Action Plan of Malang Regency 2015-2017
   e. Work Plan of Badan Penanggulangan Bencana Daerah of Malang Regency 2014, 2015, 2016, 2017, 2018

f. Performance Report of Badan Penanggulangan Bencana Daerah of Malang Regency 2014, 2015, 2016, 2017
g. Act No. 24 of 2007 on Disaster Management
h. Documentation of disaster risk reduction program.

3.5 Technique of Data Collection

Data collection technique is a systematic and standard procedure for obtaining necessary data. In this study adjusting to the strategy of disaster risk reduction, the data collection techniques that suitable for researcher during the study are as follows:

1. Interview

   A technique that done by direct open question and answer to the specified thing. Interview conducted with some actors who can provide information related to disaster risk reduction strategy by Badan Penanggulangan Bencana Daerah of Malang Regency.

2. Documentation

   Documentation is a technique for data collection using writing and picture. Documentation used by the researcher are documents, photos, archives, and official reports related to this research.

3.6 Instrument of Research

The research instrument is a set of tools used by the researcher to obtain, manage, present, analyze and describe data/information. Instruments used in this study include:

1. Researcher

   Characteristic of qualitative research is inseparable from the role of researcher. Qualitative research is often subjective. The researcher needs to understand themselves to avoid ethnocentrism related to moral culture, ethics, social customs, and beliefs.

2. Interview guideline

   The interview guideline is useful for the researcher to direct in finding the data needed for research, such as indicator or point derived from research focus.

3. Documentation tools

   In this study, researcher used supporting tools such as a pocket book, stationery, mobile phone, camera, and laptop.

3.7 Data Analysis

This activity is carried out to give meaning to the data and information that collected and carried out continuously from beginning to the end. The analysis and interpretation are adapted to the theoretical framework that relates to the research problem. According to Hadisubroto (2007: 20), there is no standard procedure for qualitative approach data analysis. The researcher must make it themselves. So that the accuracy of data analysis depends on the critical power, knowledge and experience of the researcher.

In this study, the researcher applies Strauss and Corbin data analysis model. According to Strauss and Corbin in a book written by McNabb (2002) entitled "Research Methods in Public Administration and Non-Profit Management", the three basic steps in qualitative research are:

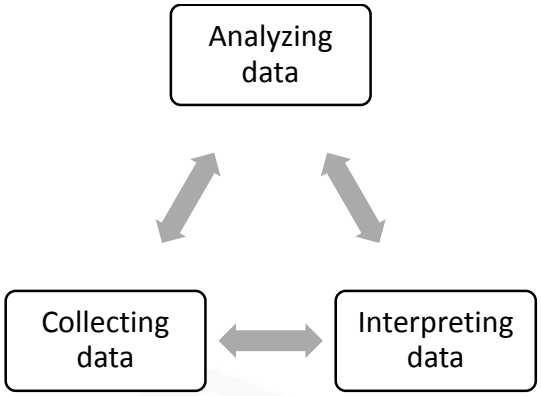


Figure 3.1 Data Analysis Model by Strauss and Corbin
Source: processed by Researcher, adapted from McNabb (2002)

1. Collecting qualitative data

   Researcher collect data by participating in social situation and write what researcher view, captured by video or voice recorder of an event, perception or personal value, or can also analyze documents and other media.

2. Analyzing qualitative data

   Analysis and interpretation of data begin by bringing data on several levels. The researcher identifies and selects relevant categories to sort the data. Furthermore, researcher compares the data with the categories that have been made, this process is called conceptualizing which means reducing the raw data which too large so that the necessary data can be used easily.

3. Interpreting qualitative data

   Interpret patterns and relationships that are expressed or hidden by bringing data according to the research focus. Interpretation occurs when researcher draws conclusion from any structure that revealed in the data. When using chart diagrams, the researcher should examine and explain the interrelationship between data. This explanation is the main of a satisfactory and meaningful report.

CHAPTER 4

FINDINGS AND ANALYSIS

4.1 Overview of Location and Site of Research

4.1.1 Overview of Malang Regency

Administratively, Malang Regency consists of 33 districts, 12 sub-districts, 378 villages, 3.217 community units and 14.718 neighborhood units. Administrative boundaries of Malang Regency are as follows: North (Jombang, Mojokerto and Pasuruan); South (Indonesia Ocean); West (Blitar and Kediri); and East (Lumajang and Probolinggo). Malang Regency is inhabited by 2.560.675 people on 2017. The number consists of men 1.286.867 people (50.38%) and women 1.273.808 people (49.62%).

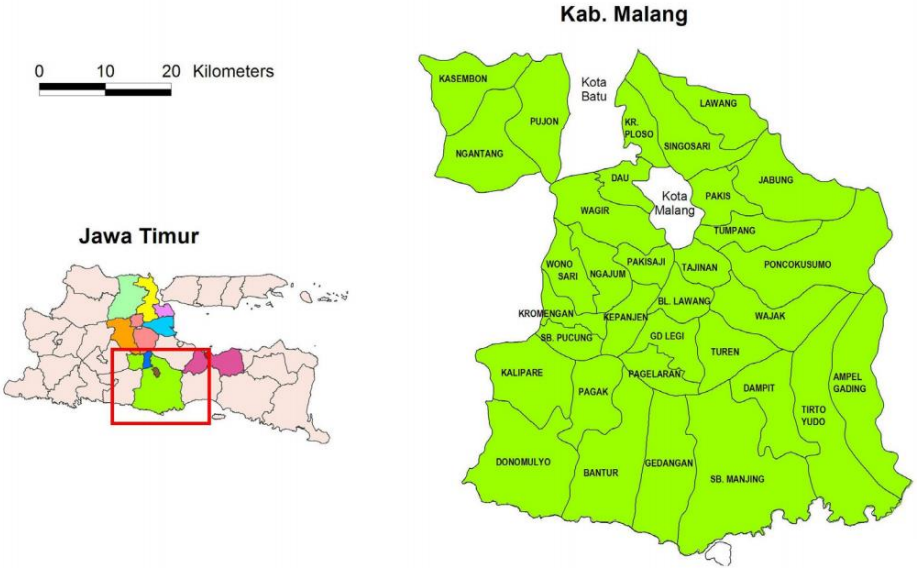


Figure 4.1 Map of Malang Regency Area
Source: bpbd.malang.go.id

Malang Regency has 3347.87 km^2 total area, located in East Java Province which is the second largest area on Java island. Malang Regency is surrounded by mount Kelud, Kawi, Panderman, Anjasmoro, Welirang, Arjuna, Bromo, Batok,

Semeru and Kendeng. The conditions are mountains, bumpy lands and lowlands on the southern coast, also hilly beaches. The flat areas are mostly located in Bululawang, Gondanglegi, Tajinan, Turen, Kepanjen, Pagelaran, Pakisaji, Singosari, Lawang, Karangploso, Dau, Pakis, Dampit, Sumberpucung, Kromengan, Pagak, Kalipare, Donomulyo, Bantur, Ngajum, and Gedangan sub-district. The bumpy areas are located in Sumbermanjing Wetan, Wagir and Wonosari sub-district. The steepest hilly areas are mostly in Pujon, Ngantang, Kasembon, Poncokusumo, Jabung, Wajak, Ampelgading and Tirtoyudo sub-district.

Seeing that geographical condition, in fact is Malang Regency area has the high level of vulnerability to the disaster. Based on Local Regulation No. 3 of 2010 on Spatial Plans and Regional Planning, it is explained that disaster prone areas include:

a. Landslide-prone areas, are Ampelgading, Poncokusumo, Donomulyo, Dau, Pujon, Ngantang, Kasembon, Kalipare, Pagak, Bantur, Gedangan, Sumbermanjing Wetan, Singosari, Jabung, Tirtoyudo, Kromengan, and Pakisaji sub-district.
b. Flood-prone areas, are Brantas, Metro and Lesti river areas.
c. Volcanic eruption prone areas, are Poncokusumo, Ngantang, Dau, and Wagir sub-district.
d. Earthquake-prone areas, are Gedangan, Sumbermanjing Wetan, Dampit, Tirtoyudo, Ampelgading sub-district.
e. Land movement prone areas, are Ampelgading, Tirtoyudo, Sumbermanjing Wetan sub-district.
f. Areas located in the active fault, are District Gedangan, Sumbermanjing Wetan, Dampit, Tirtoyudo and Ampelgading sub-district.
g. Tsunami-prone areas, are all coastal areas in the southern part of Malang Regency.

Meanwhile, based on mapping of disaster prone areas of Malang Regency arranged by Badan Penanggulangan Bencana Daerah of Malang Regency can be described in the following table:

Table 4.1 Mapping of Disaster Prone Areas of Malang Regency

District	Type of Disaster								
	1	2	3	4	5	6	7	8	9
1. Kasembon	√	√	√	√	√	√	√	√	x
2. Ngantang	√	√	√	√	√	√	√	√	x
3. Dau	√	√	√	√	√	√	√	√	x
4. Wagir	√	√	√	√	√	√	√	√	x
5. Wonosari	√	√	√	√	√	√	√	√	x
6. Ngajum	√	√	√	√	√	√	√	√	x
7. Pakisaji	√	x	x	√	√	x	√	x	x
8. Kromengan	√	√	√	√	√	x	√	√	x
9. Sumberpucung	√	√	√	√	√	x	√	√	x
10. Kalipare	√	√	√	√	√	x	√	√	x
11. Donomulyo	√	√	√	√	√	x	√	√	√
12. Pagak	√	√	√	√	√	x	√	√	x
13. Kepanjen	√	x	x	√	√	x	√	x	x
14. Bantur	√	√	√	√	√	x	√	√	√
15. Gedangan	√	√	√	√	√	x	√	√	√
16. Sumbermanjing Wetan	√	√	√	√	√	x	√	√	√
17. Pagelaran	√	x	x	√	√	x	√	x	x
18. Gondanglegi	√	x	x	√	√	x	√	x	x
19. Turen	√	√	√	√	√	x	√	√	x
20. Dampit	√	√	√	√	√	x	√	√	x
21. Tirtoyudo	√	√	√	√	√	x	√	√	√
22. Ampelgading	√	√	√	√	√	√	√	√	√
23. Bululawang	√	x	x	√	√	x	√	x	x
24. Wajak	√	√	√	√	√	x	√	√	x
25. Tajinan	√	x	x	√	√	x	√	x	x
26. Poncokusumo	√	√	√	√	√	√	√	√	x
27. Tumpang	√	√	√	√	√	x	√	√	x
28. Jabung	√	√	√	√	√	√	√	√	x
29. Pakis	√	√	√	√	√	x	√	√	x
30. Singosari	√	√	√	√	√	x	√	√	x
31. Lawang	√	√	√	√	√	x	√	√	x
32. Karangploso	√	√	√	√	√	x	√	x	x
33. Pujon	√	√	√	√	√	√	√	√	√

Source: Profile of BPBD Malang Regency 2014

Information:
(1) Tornado (2) Flood (3) Landslide (4) Drought (5) Home fires (6) Volcano (7) Earthquake (8) Forest fire (9) Tsunami

According to the mapping of preparedness study, it can be seen that the Regional Resilience Component based on Community Preparedness to face the possible disaster in Malang Regency is LOW, as can be seen in the table below:

Table 4.2 Preparedness Index of Malang Regency

Preparedness	Index of PB	Index of KKB	Index of RTD	Index of PDB	Index of MS	Total of Index	Level
Household	18,53	2,87	2,71	5,72	3,97	33,80	Low
School Community	17,24	2,88	4,01	0,96	0,92	26,02	Low
Malang Regency	18,02	2,88	3,23	3,82	2,75	30,69	Low

Source: Disaster Management Plan of Malang Regency 2015-2019

In general, the table above explains that the average level of preparedness of Malang Regency is low, because the Household Index is 33.80, School Community Index is 26.02, and Malang Regency Index is 30.69. Thus, the resilience level of households, school communities and Malang Regency is at a low level because it has a small scale.

The risk level of potential disaster threat is obtained based on a combination of loss rate and capacity level. From the combination of these levels, it obtained the risk level for each type of disaster in Malang Regency. Result of disaster risk level in the following table:

Table 4.3 Level of Disaster Risk of Malang Regency

No	Type of Disaster	Risk Level
1.	Flood	High
2.	Extreme Waves and Abrasion	High
3.	Earthquake	High
4.	Forest and Land Fires	High
5.	Drought	High
6.	Epidemics and Disease	Medium
7.	Volcano Eruption	Medium
8.	Extreme Weather and Tornado	High
9.	Landslide	High
10.	Tsunami	High

Source: Disaster Management Plan of Malang Regency 2015-2019

Overview of some aspects above shows that Malang Regency is a regency that has many potential disasters and including as disaster-prone area with high

level category. Thus, disaster risk reduction efforts must be continuously carried out through an effective strategy.

4.1.2 Profile of Badan Penanggulangan Bencana Daerah of Malang Regency

Badan Penanggulangan Bencana Daerah established with the beginning of National Disaster Management Agency (Badan Nasional Penanggulangan Bencana) as the centre. Based on Act No. 24 of 2007 on Disaster Management; Ministry Regulation of Home Affairs No. 46 of 2008 on Guidelines and Organization of Working Procedures of Badan Nasional Penanggulangan Bencana; and Regulation of Head of Badan Nasional Penanggulangan Bencana No. 3 of 2008 on Establishment of Regional Disaster Management Agency; Local Regulation of Malang Regency No. 1 of 2007 on Organization of Regional Devices; Local Regulation of Malang Regency No. 4 of 2011 on Disaster Management; Regulation of Malang Regent No. 25 of 2011 on Regional Disaster Management Agency, then Government of Malang Regency established Badan Penanggulangan Bencana Daerah of Malang Regency, which then becomes the basis for realizing the implementation of disaster management that planned, integrated, coordinated, and comprehensive.

Vision of Badan Penanggulangan Bencana Daerah of Malang Regency is "**Realization of Malang Regency Resilience in Facing Disaster**" (*Terwujudnya Ketangguhan Masyarakat Kabupaten Malang dalam Menghadapi Bencana).* Badan Penanggulangan Bencana Daerah of Malang Regency should be able to optimize its role of disaster management coordination and continue to encourage community involvement efforts in increasing preparedness to face the disaster and

to build public awareness in mainstreaming disaster risk reduction on various aspects of national life.

Implementation in realizing the vision that has been formulated, translated through the mission with the objectives and targets to be achieved, which then further outlined in the program formulation. As the direction of organization, then the formulation of mission is carried out by referring the main tasks and functions of the organization. The missions of Badan Penanggulangan Bencana Daerah of Malang Regency are:

1. Protecting community from disaster threats through disaster risk reduction;
2. Making a reliable disaster management system;
3. Organizing disaster management in a planned, integrated, coordinated and comprehensive manner.

The effort to achieve the mission need a synergic cooperation between governmental and non-government institutions, also the community to be able to implement the programs of Badan Penanggulangan Bencana Daerah in accordance with the direction of policy and performance goals planned.

The objectives of Badan Penanggulangan Bencana Daerah of Malang Regency in 2016-2021 are as follows:

1. Improve community empowerment in prevention and optimal preparedness
2. Optimize the management of responsive disaster emergency and logistical support for better disaster management handling
3. Improve community recovery and better infrastructure facilities.

Goals are the result to be achieved in specific, measurable, on time consistently and continuously in line with the stated objectives. With referring to the objectives of disaster management, the targets to be achieved at the end of 2021 are:

1. Increase the awareness of natural disaster vulnerability
2. Realize the natural disaster management, responsive emergency response and logistic support
3. Increase the handling of rehabilitation and reconstruction to disaster occurred.

The organization structure of Badan Penanggulangan Bencana Daerah of Malang Regency in the picture is as follows:

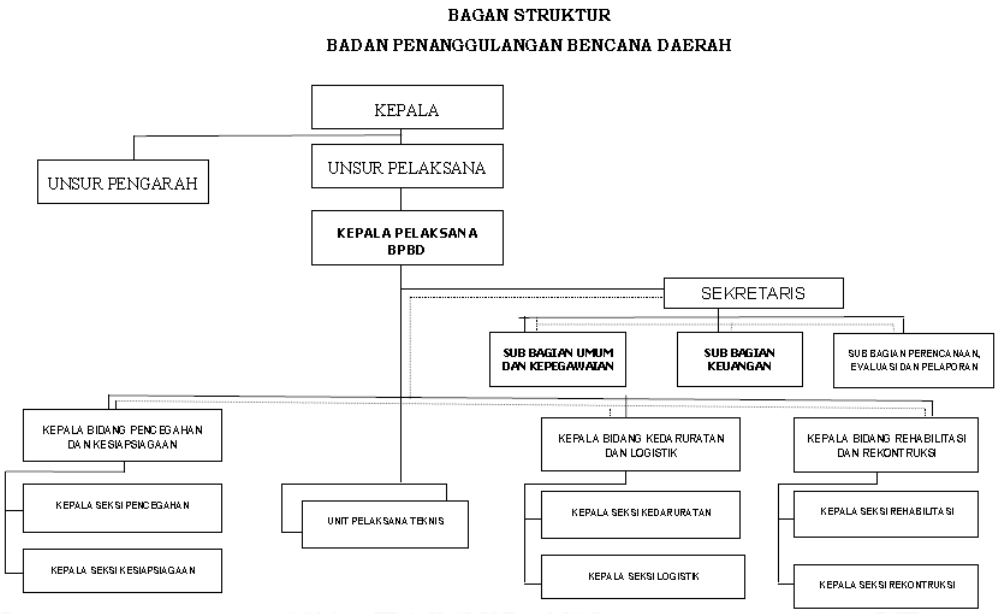


Figure 4.2 Organization Structure of BPBD Malang Regency
Source: bpbd.malangkab.go.id

From the picture above can be explained by the task explanation, based on Local Regulation of Malang Regency No. 25 of 2011 on Regional Disaster Management Agency, the organization structure of Badan Penanggulangan Bencana Daerah consists of:

A. Head of Agency

Head of Badan Penanggulangan Bencana Daerah on ex-officio is held by Regional Secretary.

B. Steering Element; and

C. Executive Element

Executive Element of Badan Penanggulangan Bencana Daerah is under and responsible to the Head of Agency. Executive Element is led by Chief Executive who assists the Head of Agency in the implementation of duties and functions. Executive Element of Badan Penanggulangan Bencana Daerah has the task of implementing integrated disaster management that includes pre-disaster, during emergency and post disaster response. To carry out the task, Executive Element has functions:

1. Coordinating the implementation of disaster management in the region;
2. Leading the implementation of regional disaster management;
3. Implementating the regional disaster management.

The organization structure of Badan Penanggulangan Bencana Daerah of Malang Regency according to Local Regulation No. 25 of 2011, the composition as follows:

a. Chief Executive
b. Executive Secretary, in charge:
    1. Subdivision of Administration and Resources
    2. Subdivision of Finance
    3. Subdivision of Planning, Evaluation and Reporting
c. Division of Prevention and Preparedness, in charge:
    1. Subdivision of Prevention
    2. Subdivision of Preparedness
d. Division of Emergency and Logistic, in charge:
    1. Subdivision of Emergency
    2. Subdivision of Logistic
e. Division of Rehabilitation and Reconstruction, in charge:
    1. Subdivision of Rehabilitation
    2. Subdivision of Reconstruction.

The main duties and functions of each position are as follows:

a. Chief Executive

1. Lead, supervise, encourage, control and implement the cooperation and coordination on disaster management;
2. Carry out other tasks assigned by the Regent in accordance with the field of duty.

b. Executive Secretary has the task of coordinating the plan, fostering and controlling of programs, administration, resources and cooperation. Each subdivisions is headed by Head of Subdivision who is under and responsible to the Secretary.

1. Subdivision of Administration and Resources has duties:
   a) Prepare the activity plan of Subdivision;
   b) Organize, execute and manage personnel administration, welfare and training education;
   c) Carry out the organization management, correspondence, archive, household, protocol, preparation of goods, equipment and distribution;
   d) Manage and maintenance the office equipment;
   e) Manage office cleanliness and security.

2. Subdivision of Finance has duties:
   a) Prepare the activity plan of Subdivision;
   b) Carry out financial administration which includes bookkeeping, accountability, verification, and preparation of budget calculation;
   c) Arrange the materials of BPBD strategic plan.

3. Subdivision of Planning, Evaluation and Reporting has duties:
   a) Prepare the activity plan of Subdivision;
   b) Prepare the formulation of work program policies and work plans;
   c) Prepare materials for cross-sectoral cooperation;
   d) Conduct Management Information and Reporting System;
   e) Coordination and synchronization of annual activity plan;
   f) Evaluation and reporting the activities.

c. Division of Prevention and Preparedness fhave the task of coordinating and implementing general policies of disaster management in pre-disaster and community empowerment. Each subdivisions is headed by Head of Subdivision who is under and responsible to the Head of Division.

1. Division of Prevention has duties:
   a) Carry out identification and introduction of hazard threats;
   b) Monitor the management of natural resources;
   c) Supervise the implementation of spatial and environmental management;
   d) Strengthen the community social resilience.

2. Division of Preparedness has duties:
   a) Preparation of a pilot disaster emergency response plan;
   b) Organize, install and test the early warning systems;
   c) Provide and prepare supplies of basic needs;
   d) Organize, socialize, training and rehearsals on emergency response mechanisms;
   e) Prepare the evacuation site;
   f) Prepare the accurate data, information and update of disaster emergency procedures.

d. Division of Emergency and Logistic has the task of coordinating and implementing general policies of disaster management during emergency response also supporting logistics and equipment in disaster management. Each subdivisions is headed by Head of Subdivision who is under and responsible to the Head of Division.

1. Division of Emergency has duties:
   a) Implement a rapid and precise assessment of the location, damage, loss and resources;
   b) Determine the status of disaster emergency;
   c) Rescue and evaluate affected communities;
   d) Protect vulnerable groups.

2. Division of Logistic has duties:
   a) Arrange the plan of logistic and equipment in disaster management;
   b) Distribution of logistics and equipment in disaster respons;
   c) Monitor, evaluation and analysis the report of logistic and equipment in disaster management.

e. Division of Rehabilitation and Reconstruction has the task of coordinating and implementing general policies of disaster management in post-disaster and community empowerment. Each subdivisions is headed by Head of Subdivision who is under and responsible to the Head of Division.

1. Division of Rehabilitation has duties:
   a) Improvement of disaster area's environment;
   b) Provide house improvement assistance to community;
   c) Conflict resolution and reconstruction;
   d) Recovery of psychological, social, economic, cultural, security and governmental functions.

2. Division of Reconstruction has duties:
   a) Undertake the reconstruction of infrastructure and facilities;
   b) Rebuild the social facilities;
   c) Implement appropriate design and use of disaster-resistant equipment;
   d) Improve social, economic and cultural conditions;
   e) Improve the function of public services.

4.2 Presentation of Data

Indonesia Constitution 1945 reaffirmed in Act No. 24 of 2007 on Disaster Management stated that government is responsible for protecting the entire Indonesian nation with the aim to providing life protection, it also contains the protection of disaster, in order to realizing the public welfare based on Pancasila. It is also stated in the Act that disaster management is a joint matter of government, society, business, non-government organization, international, and other stakeholders.

In the governance and development, local government can directly contribute to the improvement of services and community welfare. Therefore, in order to support the governance and development in region, it needs well planning. Regional development planning is expected to follow the rules of planning that systematic, integrated, transparent, accountable, relevant and consistent with other plans. Stakeholder and legislative involvement in the planning process is crucial to ensure that the plan draws up the support of all parties that leads to more optimal goals and objectives.

Badan Penanggulangan Bencana Daerah is one of the local institutions that based on Act No. 17 of 2003 on Regional Finance, Act No. 25 of 2004 on National Development Planning System and Act No. 23 of 2014 on Local Government is required to compile a strategic medium term planning documents called Strategic Plans (RENSTRA). The Strategic Plan of Badan Penanggulangan Bencana Daerah is one of regional planning documents required to direct the service of BPBD specifically and regional development generally, which has a duration of five years, in line with the elected Regent and Vice Regent periods. The Strategic Plan of Local Government is principally directed to answer three basic questions: (1) Where the service of Badan Penanggulangan Bencana Daerah will be directed towards its development and what will be achieved within five years; (2) How to achieve it; and (3) What strategic steps that need to be taken to achieve the objectives. Strategic Plan document of Badan Penanggulangan Bencana Daerah of Malang Regency 2016-2021 is arranged in accordance with main task and function of Badan Penanggulangan Bencana Daerah and based on Medium-term Regional Development Plan (RPJMD) of Malang Regency 2016-2021.

The linkage between Strategic Plan BPBD Malang Regency 2016-2021 with RPJMD Malang Regency are:

a. BPBD Malang Regency prepared Preliminary Draft of Strategic Plan by referring to Draft of RPJMD Malang Regency;
b. The draft of RPJMD Malang Regency 2016-2021 becomes the input in deciding the Strategic Plan of BPBD Malang Regency;
c. In the final stages, the final draft of RPJMD Malang Regency that has been determined by Local Regulation is used as the guideline for BPBD Malang Regency in determining the final draft of Strategic Plan 2016-2021.

In the Strategic Plan of BPBD Malang Regency described that the strategic issues of BPBD Malang Regency are:

1. Prepare Disaster-Resistant Villages in disaster prone areas
2. Rapid, accurate and appropriate assessment of potentially disaster-prone areas through disaster risk reduction efforts
3. Disaster response socialization and training to the community
4. Implementation of disaster management during the emergency response, rescue and evacuation of affected communities
5. Fulfill basic needs for disaster victims
6. Provide priority protection to vulnerable groups such as rescue, evacuation, security, health and psychosocial services
7. Facilitate reconstruction of infrastructure and facilities
8. Recovery by rehabilitation and reconstruction of community housing.

While the policy of BPBD Malang Regency are:

1. Increase awareness and role of community in disaster management effort
2. Increase professionalism of officers who handle disaster management
3. Develop disaster management system in an integrated and conceptional manner
4. Develop a comprehensive and applicable disaster management method
5. Utilize the science and technology in dealing with disaster management issues.

4.2.1 Strategy of Disaster Risk Reduction

Strategy setting is intended to define how to achieve goals, based on a rational analysis of concepts and reality in the field. The strategy then used as a guideline in the implementation of daily operations of all BPBD Malang Regency components. Based on the Disaster Management Plan of Malang Regency 2015-2019 there are generally two types of disaster management strategies that are divided into generic strategy and specific strategy for each disaster. Generic strategy is a strategy that applies to all disasters, consists of:

1. Strengthen institutional rules and capacities
2. Integrated disaster management planning
   a. Strengthen disaster information and publication system
   b. Optimize the result of disaster risk assessment to develop regional policies and plans in cross-border administrative relations
3. Research, education and training

4. Capacity building and community participation
   a. Develop access of local media to publication of local disaster management efforts
   b. Optimize partnerships in disaster management

While the strategy for each disaster consists of:

1. Community protection from disaster
   a. Disaster prevention and mitigation
   b. Disaster preparedness
2. Disaster management.

Policy is guideline to direct the formulation of selected strategies to be more directed towards achieving goals and objectives during the period of strategic plan. The formulation of policy direction rationalizes the choice of strategy to have a focus and in accordance with the implementation arrangement. Based on the formulation of strategies that have been developed and determined, the policies that taken to implement the Program of BPBD Malang Regency 2016-2021 are as follows:

1. Target: Increase the awareness of natural disaster vulnerability.

Strategies:	Policies:
a. Increase the number of Disaster-Resistant Villages;	e. Increase the number of Disaster-Resistant Villages;
b. Improve socialization of disaster;	a. Increase community capacity on disaster risk reduction;
c. Improve community empowerment;	b. Improve community empowerment on disaster risk reduction;
d. Improve Public Satisfaction Index in the field of disaster services.	c. Improvement of services and preparation of reports on PSI results of disaster management services.

2. Target: Realize the natural disaster management, responsive emergency response and logistic support.

Strategies:	Policies:
a. Improve disaster management; b. Improve emergency management; c. Increase social assistance to disaster victims.	a. Increase the role of disaster management institutions in disaster management; b. Improvement of infrastructure and the availability of infrastructure facilities; c. Improve the role quality of Disaster Management Agency.

3. Target: Increase the handling of rehabilitation and reconstruction of disaster.

Strategy:	Policies:
a. Improve post-disaster rehabilitation and reconstruction.	a. Improve development of affected infrastructure; b. Optimization of rehabilitation and reconstruction support system; c. Increase the capacity of human resources in the psychology recovery of post-disaster; d. Conduct studies of socio-economic post disaster.

4.2.1.1 Thematic Approach

The description of thematic approach is related to the theme of the strategy, whether disaster risk reduction becomes the focus of disaster management strategy. Currently the disaster sector is focusing on disaster risk reduction. Not only in Malang Regency, that initially intensified by international since 2005. In accordance with the statement of the strategy formulator:

> *"Memang BPBD Kabupaten Malang sedang gencar dalam usaha pra-bencana yaitu pengurangan risiko bencana. Sasaran utama kita adalah memberi pemahaman kepada masyarakat akan bahaya bencana dan memiliki ketahanan akan bencana. Tidak hanya dalam evakuasi, tapi juga*

dari segi pemberdayaan masyarakat, itu terdapat pada program kegiatan. Program ini mengikuti program provinsi, nasional bahkan internasional."

- Interview with Pak Joni, Head of Prevention and Preparedness Division of BPBD Malang Regency, January 15th, 2018.

(Indeed BPBD Malang Regency is focusing on pre-disaster effort that is disaster risk reduction. Our main goal is to provide understanding to people about disaster hazard and to have disaster resilience. Not only in evacuation, but also in terms of community empowerment, it is realized on BPBD programs. The program follows provincial, national and even international programs.)

Pak Joni's statement is in accordance with all disaster documents from region to international. More details in the following quotation:

Oleh karenanya landasan dalam penanggulangan bencana dan pengurangan risiko bencana akan memberikan advokasi dan dukungan kepada pemerintah dalam upaya melaksanakan pengurangan risiko bencana (PRB) secara terencana, sistematis dan menyeluruh. Pada tatanan global, pelaksanaan dari Undang-Undang tersebut juga merupakan upaya implementasi dari komitmen dunia yang tertuang dalam Kerangka Aksi Hyogo 2005-2015 yang menjadikan bangsa Indonesia memiliki komitmen terhadap dunia internasional dalam mengurangi risiko bencana, sedangkan pada Sendai Framework for Disaster Risk Reduction di Indonesia tahun 2015-2030 mempunyai Visi: "Masyarakat Indonesia yang sejahtera dan berkeadilan yang hidup di dalam lingkungan yang terkelola dengan baik" dengan Misi Gerakan Nasional Pengurangan Resiko Bencana.

- Background of Strategic Plan of BPBD Malang Regency 2016-2021.

(Therefore the foundation for disaster management and disaster risk reduction will provide advocacy and support to government in the effort of implement the disaster risk reduction (DRR) in a planned, systematic and comprehensive manner. In global, the regulation implementation is also an effort of the world commitment that stated in the Hyogo Framework for Action 2005-2015 that makes Indonesia committed to international agenda in reducing disaster risk, while in Sendai Framework for Disaster Risk Reduction in Indonesia 2015-2030 has a vision: "A prosperous and justice living of Indonesian society in a well-managed environment" with the Mission is National Movement for Disaster Risk Reduction.)

In order to better identification of strategy focus, this sub-chapter presents the data related to work programs those are part of BPBD Malang Regency strategy. Program is a form of policy instrument that contains one or more

activities carried out by local government or community, which is coordinated by local government to achieve the goals and objectives of regional development. To implement the main task and function, as a disaster management agency, Badan Penanggulangan Bencana Daerah of Malang Regency set its programs according to RPJMD 2016-2021, namely:

1. Program of Disaster Prevention and Preparedness (Pre-disaster)
   a. Monitor and dissemination of natural disaster potential information
   b. Procurement of disaster management facilities and infrastructure
   c. Disaster risk reduction planning
   d. Capacity building of government in disaster management
   e. Community empowerment in facing disaster
   f. Socialization of disaster management at school

2. Program of Disaster Emergency and Logistics (During disaster)
   a. Capacity building for disaster handling and logistics
   b. Development activities of regional disaster management system
   c. Emergency response in affected areas

3. Program of Infrastructure Rehabilitation and Reconstruction (Post-disaster)
   a. Rehabilitation and reconstruction of damaged infrastructure
   b. Recovery of socio-economic, cultural and psychological
   c. Upgrade facilities and infrastructure adapt with disaster

Effort to realize the strategy target can be seen from the realization of performance. Researcher process and present the comparison of target and performance achievement of BPBD Malang Regency from 2012 until 2017 in table below:

Table 4.4 Comparison of Work Achievements of BPBD Malang Regency

Year	No.	Strategic Target	Performance Indicator	Target	Achievement	Realization
2012	1	Reduce disaster risk at the community and increase the dissemination of disaster information Socialization of community understanding	Ratio of Capacity building on disaster-prone areas • Monitor and Dissemination of disaster prone areas • Workshop of volunteer capacity building in disaster prone areas and	0.028%	100%	0.028%

		and awareness to face disaster	Disaster Management Socialization at school			
	2	The realization of coordination to the face disaster and technical guidance of Damage and Loss assessment due to disaster	Speed of disaster handling • Implementation of Coordination in the face of disaster • Technical guidance of Damage and Loss Assessment due to disaster	100%	100%	100%
2013	1	Reduce disaster risk at the community and increase the dissemination of disaster information Socialization of community understanding and awareness to face disaster	Ratio of Capacity building on disaster-prone areas • Monitor and Dissemination of disaster prone areas • Workshop of volunteer capacity building in disaster prone areas and Disaster Management Socialization at school	0.032%	100%	0.032%
	2	The realization of coordination to the face disaster and technical guidance of Damage and Loss assessment due to disaster	Speed of disaster handling • Implementation of Coordination in the face of disaster • Technical guidance of Damage and Loss Assessment due to disaster	100%	100%	100%
2014	1	Reduce disaster risk at the community and increase the dissemination of disaster information Socialization of community understanding and awareness to face disaster	Ratio of Capacity building on disaster-prone areas • Monitor and Dissemination of disaster prone areas • Workshop of volunteer capacity building in disaster prone areas and Disaster Management Socialization at school	65 %	102.57%	66.67%

	2	The realization of coordination to the face disaster and technical guidance of Damage and Loss assessment due to disaster	Speed of disaster handling • Implementation of Coordination in the face of disaster • Technical guidance of Damage and Loss Assessment due to disaster	100%	100%	100%
2015	1	Realization of Community Empowerment in prevention and preparedness of disaster that good and optimal	Percentage of disaster capacity improvement in disaster-prone areas	70 %	104.3%	73 %
	2	Realization of responsive disaster emergency handling and better logistical support	Percentage of disaster handling	100 %	100%	100%
	3	Realization of community and infrastructure recovery	Percentage of rehabilitation and reconstruction handling	75 %	72%	54 %
2016	1	Realization of Community Empowerment in prevention and preparedness of disaster that good and optimal	Percentage of disaster capacity improvement in disaster-prone areas	75%	101%	75.75%
	2	Realization of responsive disaster emergency handling and better logistical support	Percentage of disaster handling	100%	100%	100%
	3	Realization of community and infrastructure recovery	Percentage of rehabilitation and reconstruction handling	80%	98.75%	79%
2017	1	Realization of Community Empowerment in	Percentage of disaster capacity	77%	100%	77%

		prevention and preparedness of disaster that good and optimal	improvement in disaster-prone areas			
	2	Realization of responsive disaster emergency handling and better logistical support	Percentage of disaster handling	100%	100%	100%
	3	Realization of community and infrastructure recovery	Percentage of rehabilitation and reconstruction handling	81%	100%	81%

Source: processed by Researcher from Performance Report of BPBD Malang Regency 2013-2017

The table above presents the performance of BPBD Malang Regency as a whole, not yet specialize in disaster risk reduction. Based on the performance achievement data, it is known that the achievement of all disaster risk reduction activities can be said increase, the more explanation are as follows:

A. Achievement of 2012 and 2013

The indicator of Disaster Capacity Improvement in disaster-prone areas in 2012 is targeted at 0.028% and in 2013 is targeted to 0.032%, it increased by 0.004%. Realization in 2013 was 0.032%, while in 2012 was 0.028% with 100% performance. This indicator is supported by Program of Early Prevention and Program of Community Based Disaster Management.

B. Achievement of 2014

The indicator of Disaster Capacity Improvement in disaster-prone areas with target of 65%, reached 66.67%. This calculation is based on the number of Disaster Management Community Group that has been trained in disaster-

prone areas (22 communities trained out of 33 communities in disaster-prone areas) can be said successful, this indicator is supported by:

a. Monitor and dissemination of natural disaster information potential that carried out 30 times coordination and disaster-prone areas identification.
b. Community empowerment activities in dealing with disaster by established and training of Beach Rescue Cluster (BRC) which consists of 100 people spread across various beaches in 6 districts prone to tsunami.
c. Socialization at school were held 15 times, joined by 1,500 elementary school students.

C. Achievement of 2015

The indicator of Disaster Capacity Improvement with target of 70%, reached 73%. This calculation is based on the number of Disaster Management Community Group that has been trained (24 groups trained out of 33 groups in disaster-prone areas). The achievement of 104.3% can be said successful, this indicator is supported by:

a. Monitor and dissemination of natural disaster information potential that carried out 42 times coordination and disaster-prone areas identification.
b. Community empowerment activities in dealing with disaster by socialization of volunteer capacity building in the framework of disaster risk reduction.
c. Socialization at school were held 18 times, joined by 1.800 elementary school students.
d. Workshop of Disaster-Resistant Village in three villages.
e. Training of Disaster-Resistant Village volunteers.

f. Preparation of Kelud Lava Contingency Plan.

g. Preparation of Village Information System on disaster.

h. Preparation of Regency Disaster Information System.

D. Achievement of 2016

The indicator of Disaster Capacity Improvement with target of 75%, reached 77.75%. This calculation is based on the number of Disaster Management Community Group that has been trained (25 groups trained out of 33 groups in disaster-prone areas). The achievement of 101% can be said successful, this indicator is supported by:

a. Monitor and dissemination of natural disaster information potential that carried out 34 times coordination and disaster-prone areas identification.

b. Procurement of disaster prevention facilities and infrastructure which has been implemented by purchase inventory (truck, etc) and goods delivered to the community is personal protective equipment.

c. Review of Disaster Risk Reduction Plan attended by community, Indonesian Red Cross - Regency, Institute for Disaster Management and Climate Change of Nahdlatul Ulama, Universities/Academics, and Volunteers. This activity also compiled the DRR Forum of Malang Regency.

d. Capacity building of local government personnel in disaster management which was attended by District government, Military Rayon Command, Chief of Police Sector and Chief of Pamong Praja.

e. Community empowerment in dealing with disaster by establish of Disaster-Resistant Village in Tamansari Village, Ampelgading District.

f. Socialization at school were held 25 times.

E. Achievement of 2017

The indicator of Disaster Capacity Improvement with target of 77%, reached 100%. This calculation is based on the number of Disaster Management Community Group that has been trained (33 groups trained out of 33 groups in disaster-prone areas). The achievement of 101% can be said successful, this indicator is supported by:

a. Monitor and dissemination of natural disaster information potential that carried out 33 times coordination and disaster-prone areas identification.
b. Procurement of disaster prevention facilities and infrastructure which has been implemented by purchase goods delivered to the community are manual sirens, evacuation route signs, and personal protective equipment.
c. Review of Disaster Risk Reduction Plan attended by Regional Development Planning Agency, Public Works Department of Bina Marga, Public Works Department of Cipta Karya, Health Department, Social Department, Tourism and Culture Department, Civil Service Police Unit, Malang Police Force, Military Discipline Command, Agriculture Department, and Village Government personnel.
d. Government personnel capacity building in disaster management attended by Indonesian Armed Forces, Police of Indonesia, Village Empowerment Department, Regional Development Planning Agency, Regional Finance and Asset Management Agency, Health Department, Social Department, Civil Service Police Unit, Head of Village.

e. Community empowerment in dealing with disaster by establish 3 Disaster-Resistant Village.

f. Socialization at school were held 25 times.

g. Structural Mitigation by construct a 70m retaining wall of sea water in Tamban Beach, Sumbermanjing Wetan District.

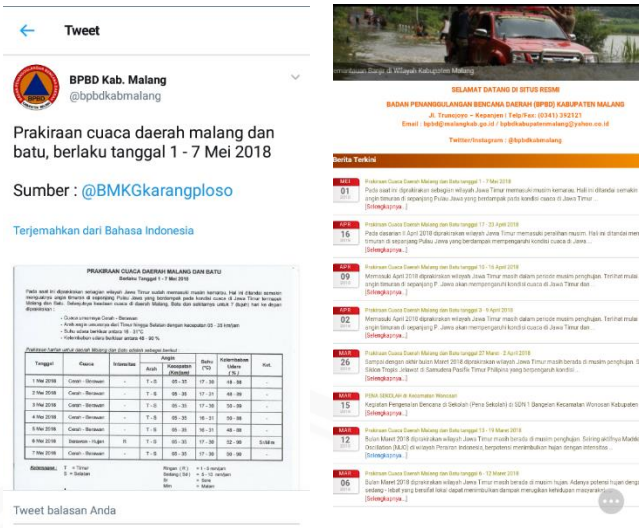
4.2.1.2 Holistic Approach

In holistic planning, it requires a relevance between program and indicator of disaster risk reduction. Therefore, the elaboration of entire disaster risk reduction programs of BPBD Malang Regency is needed before identifying whether the disaster risk reduction program of BPBD Malang Regency already covers all the disaster risk reduction indicators and can solve the high disaster risk problem. The explanation of disaster risk management program of BPBD Malang Regency is as follows:

1. Monitor and Dissemination of Natural Disaster Information Potential

   This program is to disseminate disaster information in Malang Regency by installing signs on disaster area, distributing brochures and banners, posting on social media, and direct socialization to the community.

Signs Installation at Goa Cina and Balekambang Beach, Sumbermanjing Wetan District



Twitter and Website of BPBD Malang Regency to inform weather condition

Figure 4.3 Activities of Disaster Potential Dissemination

Source: documentation of Researcher, 2018

2. Procurement of Disaster Prevention Facilities and Infrastructure

Procurement of facilities and infrastructure is a disaster risk reduction program that supports disaster response activity. The goods provided are used as a support of warning system and evacuation equipment when disaster occurs.

Figure 4.4 Installation of sirens and landslide detection devices at Pandansari Village, Poncokusumo District

Source: documentation of Researcher, 2018

3. Disaster Management Plan

   Arrange the Disaster Risk Reduction document consists of disaster risk information, integration of perceptions on how disaster risk reduction is implemented, also update data of regional capacity and vulnerability. This program involves several related institutions and community groups.

Figure 4.5 Disaster Management Plan of Malang Regency 2015-2019
Source: documentation of Researcher, 2018

4. Capacity Building of Government Personnel in Disaster Management

   This program is to increase the capacity of local government personnel (other agencies) in disaster management by holding a workshop. This program aims to make the local government personnel understand disaster management and can protect the community during disaster.

5. Community Empowerment in Facing Disaster

   Empowerment program by establishing Disaster-Resistant Village, disaster risk reduction effort by increasing the preparedness capacity, which is planned and implemented by the community as the main actor. Community in the disaster-resistant villages are actively involved in assessing, analyzing, handling, monitoring, evaluating and mitigating disaster risks that exist in their region by utilizing local resources.

Figure 4.6 Community empowerment through *Desa Tangguh Bencana*
Source: documentation of Researcher, 2018

6. Socialization of Disaster Management at School

   Disaster socialization at schools that prone to disaster, because elementary school students are the most vulnerable group who have high potential as victims of natural disaster. The activities include potential disaster information, how to deal with disasters, until rehearsal/disaster simulation.

Figure 4.7 Socialization to SDN Ardirejo students at BPBD Malang Regency office
Source: documentation of Researcher, 2018

7. Structural Mitigation

   Efforts to minimize disaster risk through the construction of various physical infrastructure and using a technology approach.

4.2.1.3 Integrative Approach

The keyword of integrative approach is the integration of actors and funding sources. After the disaster risk reduction strategy is analyzed with thematic and holistic approach, then the strategy is further elaborated into who is implementing and the funding source used. Disaster risk reduction of Malang Regency is the responsibility of Badan Penanggulangan Bencana Daerah of Malang Regency. However, this cannot be separated from other parties related to disaster prevention in Malang Regency. Programs and funding sources can be seen in the following table:

Table 4.5 Funding Resource of Disaster Risk Reduction Program of BPBD Malang Regency

Year	No.	Programs	Activities	Funding Resource	
				APBD	Other
2014	1	Early Prevention and Disaster Management	Monitor and dissemination of natural disaster information	Yes	
	2	Community Based Disaster Management	Community empowerment in dealing with disaster	Yes	
			Socialization of disaster management at school	Yes	
2015	1	Early Prevention and Disaster Management	Volunteer Capacity Building	Yes	
			Socialization of disaster management at school	Yes	
			Workshop of Disaster-Resistant Village		BNPB
			Training of Disaster-Resistant Village volunteers		BNPB
			Seminar of Disaster-Resistant Village		BNPB

			Preparation of Kelud Contingency Plan		UNDP
			Preparation of Village Information System on disaster		UNDP
			Preparation of Regency Disaster Information System (SIKK)		UNDP
	2	Community Based Disaster Management	Community empowerment in dealing with disaster	Yes	
			Socialization of disaster management at school	Yes	
2016	1	Disaster Prevention and Preparedness	Monitor and dissemination of natural disaster information	Yes	
			Procurement of disaster prevention facilities and infrastructure	Yes	
			Review of Disaster Risk Reduction Plan	Yes	
			Capacity building of government personnel in disaster management	Yes	
			Community empowerment in dealing with disaster	Yes	
			Socialization of disaster management at school	Yes	
2017	1	Disaster Prevention and Preparedness	Monitor and dissemination of natural disaster information	Yes	
			Procurement of disaster prevention facilities and infrastructure	Yes	
			Review of Disaster Risk Reduction Plan	Yes	
			Capacity building of government personnel in disaster management	Yes	
			Community empowerment in dealing with disaster	Yes	
			Socialization of disaster management at school	Yes	
			Structural Mitigation	Yes	

Source: processed by Researcher from Performance Report of BPBD Malang Regency 2014, 2015, 2016, 2017

The table above shows the funding source of disaster risk reduction activities by BPBD of Malang Regency is from Regional Expenditure Budget (APBD), facilitation funding of community empowerment is from Badan Nasional Pennaggulangan Bencana and United Nations Development Program. Almost all program funding is sourced from Regional Expenditure Budget, as explained by staff of Planning, Evaluation and Reporting division:

> *"Memang kita dapat sumber pendanaan hanya dari APBD. Jika ada dana dari pusat atau provinsi, masuknya ke dana APBD dulu baru ke BPBD. Pihak lain seperti swasta ada yang mendukung, tetapi biasanya bukan berupa dana, melainkan program pemfasilitasan atau alat-alat kebutuhan. Seperti Bank Jatim yang memberikan mobil tangki air pada tahun 2016 dan 2017."*
>
> - Interview with Bu Aan, staff of Planning, Evaluation and Reporting division, March 6th, 2018.

> (Indeed we gained funding only from APBD. If there is funding from the central or provincial government, it enter into APBD first then to BPBD. Other parties such as private sector are supportive, but usually not in the form of budget, but program facilitation or goods needed. Such as Bank Jatim that provided water tank cars in 2016 and 2017.)

The same thing was stated by staff of Preparedness division, no other funding source in the program implementation of BPBD Malang Regency. The other parties involved as facilitator of activity and as the implementer of activity. He said:

> *"Tidak ada sumber dana lain selain APBD. Pihak lain biasanya tidak memberikan dana langsung tetapi berupa program dan alat-alat. Seperti Australian Aid, USAID APIK dan Lembaga Penanggulangan Bencana Nahdlatul Ulama, mereka membantu dalam pembuatan Rencana Penanggulangan Bencana 2015-2019. Bank Jatim pernah memberikan dua unit mobil tangki. Kemudian banyak kelompok masyarakat yang menjadi partner kami dalam kegiatan manajemen bencana."*
>
> - Interview with Pak Indra, staff of Prevention and Preparedness division, March 6th, 2018.

(No other funding source than APBD. Other parties usually do not provide direct budget but in the form of programs and goods. Like Australian Aid, USAID and Nahdlatul Ulama Disaster Management Agency, they assist in arrangement of Disaster Management Plan 2015-2019. Bank Jatim gave two units of tank cars. Then many community groups become our partners in disaster management activities.)

Figure 4.8 Car from Bank Jatim Grants
Source: documentation of Researcher, 2018

From interview with two BPBD staffs and review of performance reports, institutions that supporting BPBD in disaster risk reduction are Australian Agency for International Development (Australian Aid), United Nations Development Program (UNDP), United States Agency for International Development (USAID), Nahdlatul Ulama for Disaster Management and Climate Change, and Bank Jatim. In addition, there are community groups who become partners of BPBD Malang Regency in implementing disaster risk reduction activities are:

1. Rapid Response Team, consists of community that care for disaster, are as follows:

Table 4.6 Rapid Response Team for Disaster

No.	Institution	Total of Personnel
1.	Komando Disiplin Militer 0818 Malang	6
2.	Polisi Resor Malang	6
3.	Sentra Komunikasi Mitra POLRI	8
4.	Satuan Polisi Pamong Praja Perlindungan Masyarakat	55
5.	SAR AWANGGA	35

6.	SAR Mahameru	15
7.	SAR Trenggana	20
8.	Jangkar Kelud	40
9.	Kobar Bromo Semeru	40
10.	SAR Malang Selatan Rescue	25
11.	Berantas	14
12.	PMI Kabupaten Malang	150
13.	PMI Kota Malang	82
14.	Pramuka	50
15.	Taruna Siaga Bencana	45
16.	Satuan Siaga Bencana	45
17.	ORARI Malang	12
18.	RAPI Kepanjen	14
19.	TFC Kota Malang	13
20.	Nusantara Berduka (Nasaduka)	10
21.	Sekolah Tinggi Ilmu Kesehatan Kepanjen	75
22.	Universitas Merdeka Malang	18
23.	Universitas Muhamadiyah Malang	18
24.	Karang Taruna	20
25.	Relawan Desa Tangguh Bencana	150
	TOTAL	**966**

Source: Prevention and Preparedness Division of BPBD Malang Regency, 2018

2. Disaster Management Unit in District

Table 4.7 Disaster Management Unit in District

No.	District	Total of Personnel
1	Ngantang	20
2	Gedangan	10
3	Pagak	6
4	Bantur	9
5	Kasembon	14
6	Jabung	18
7	Poncokusumo	17
8	Sumbermanjing Wetan	21
9	Tirtoyudo	8
10	Dampit	8
11	Ampelgading	8
12	Donomulyo	7
13	Pujon	6
14	Wajak	10
15	Kalipare	2
16	Singosari	2
17	Dau	10
	TOTAL	**184**

Source: Prevention and Preparedness Division of BPBD Malang Regency, 2018

3. Beach Rescue Team

Table 4.8 Beach Rescue Team

No	District	Name of Beach	Total of Personnel
1	Ampelgading	Licin	10
2	Tirtoyudo	Lenggoksono	10
3	Sumbermanjing Wetan	Tamban	10
		Sendang Biru	10
		Goa Cina	10
4	Gedangan	Bajul Mati	10
		Wonogoro	5
5	Bantur	Balekambang	10
		Kondang Merak	10
6	Donomulyo	Kondang Iwak	5
		Ngliyep	5
		Jugring Saloko	5
		TOTAL	**100**

Source: Prevention and Preparedness Division of BPBD Malang Regency, 2018

The community groups are empowered by BPBD Malang Regency which then has function of protecting the community. Recognized by Head of Prevention and Preparedness, the involvement and activeness of community groups as volunteers for disaster preparedness is very helpful to the performance of BPBD Malang Regency. He said, *"Tentu saja kita sangat terbantu oleh adanya mereka (tim relawan bencana). Mereka sebagai second marketer yang meneruskan informasi sosialisasi dari BPBD. Mereka memberikan edukasi kepada masyarakat akan bahaya bencana dan penolong apabila bencana terjadi."* - Interview with Pak Joni, Head of Prevention and Preparedness of BPBD Malang Regency, January 15th, 2018. (Of course we are greatly helped by them (volunteers). They are as second marketer who forward the socialization information from BPBD. They educate the community about disaster hazard and rescue the community when disaster occur).

Many community groups involved, it is expected that the commitment and involvement of volunteers in disaster management is not only done during disaster and after disaster, but in pre-disaster and there is a disaster potential condition, they remain committed and can play an active role in disseminating the disaster risk reduction program at every opportunity in various layers community. BPBD's obligations are more emphasized on the development and improvement of their capacity and commitment with the hope of continuing to play an active role in disaster risk reduction in their regions.

4.2.1.4 Spatial Approach

The keyword of spatial approach is the interrelatedness of location and integrated activities. The activities in the planning document have to functional for every location. It should be related to each other in a unified territory and inter-regional linkages. So the presentation of data in this section explains which areas have disaster risks and which areas are the target of BPBD disaster risk reduction activities in Malang Regency.

Losses potential caused by disaster in an area in a certain period of time are death, injury, illness, life threatened, loss of security, displacement, damage or loss of property, and disruption of community activities. The risk level of each disaster threat potential in Malang Regency is obtained based on a combination of loss rate and capacity level. From the combination of those levels, obtained the risk level for each type of disaster in Malang Regency. The result of disaster risk level in Malang Regency are described in disaster-prone map as follows:

Table 4.9 Mapping of Disaster-Prone Areas of Malang Regency

District	Type of Disaster								
	1	2	3	4	5	6	7	8	9
1. Kasembon	√	√	√	√	√	√	√	√	x
2. Ngantang	√	√	√	√	√	√	√	√	x
3. Dau	√	√	√	√	√	√	√	√	x
4. Wagir	√	√	√	√	√	√	√	√	x
5. Wonosari	√	√	√	√	√	√	√	√	x
6. Ngajum	√	√	√	√	√	√	√	√	x
7. Pakisaji	√	x	x	√	√	x	√	x	x
8. Kromengan	√	√	√	√	√	x	√	√	x
9. Sumberpucung	√	√	√	√	√	x	√	√	x
10. Kalipare	√	√	√	√	√	x	√	√	x
11. Donomulyo	√	√	√	√	√	x	√	√	√
12. Pagak	√	√	√	√	√	x	√	√	x
13. Kepanjen	√	x	x	√	√	x	√	x	x
14. Bantur	√	√	√	√	√	x	√	√	√
15. Gedangan	√	√	√	√	√	x	√	√	√
16. Sumbermanjing Wetan	√	√	√	√	√	x	√	√	√
17. Pagelaran	√	x	x	√	√	x	√	x	x
18. Gondanglegi	√	x	x	√	√	x	√	x	x
19. Turen	√	√	√	√	√	x	√	√	x
20. Dampit	√	√	√	√	√	x	√	√	x
21. Tirtoyudo	√	√	√	√	√	x	√	√	√
22. Ampelgading	√	√	√	√	√	√	√	√	√
23. Bululawang	√	x	x	√	√	x	√	x	x
24. Wajak	√	√	√	√	√	x	√	√	x
25. Tajinan	√	x	x	√	√	x	√	x	x
26. Poncokusumo	√	√	√	√	√	√	√	√	x
27. Tumpang	√	√	√	√	√	x	√	√	x
28. Jabung	√	√	√	√	√	√	√	√	x
29. Pakis	√	√	√	√	√	x	√	√	x
30. Singosari	√	√	√	√	√	x	√	√	x
31. Lawang	√	√	√	√	√	x	√	√	x
32. Karangploso	√	√	√	√	√	x	√	x	x
33. Pujon	√	√	√	√	√	√	√	√	√

Source: Profile of BPBD Malang Regency 2014

Information:
(1) Tornado (2) Flood (3) Landslide (4) Drought (5) Home fires (6) Volcano (7) Earthquake (8) Forest fire (9) Tsunami

The table above shows the disaster type that located at a certain point in Malang Regency. All areas in Malang Regency have potential and risk of tornado, drought, housing fire and earthquake disaster. Almost all districts in Malang Regency have risk of flood, landslide and forest fire, which is six districts are not.

One-third of Malang Regency, which is 11 districts, has risk of volcano eruption. And 8 districts in Malang Regency have risk of tsunami disaster.

The high level of disaster risk that faced by community depend on the capacity of the community to deal with it. Malang Regency is divided into 33 districts where each district has different capacity in disaster risk reduction effort. The difference in capacity will depend on local commitment, resources (whether in infrastructure, human, and financial), regional characteristics and disaster potential in the area. The result of disaster risk assessment listed in the Disaster Management Plan 2015-2019 categorize sub-districts with low, medium and high-capacity areas. Here are the result: (disaster risk map is in attachment)

a. Flood

   Low capacity areas of flood disaster are in Ampelgading, Tirtoyudo, Gedangan, Poncokusumo, Ngantang districts.

b. Tsunami

   Low capacity areas of tsunami disaster are in Tirtoyudo and Ampelgading districts.

c. Earthquake

   Low capacity areas of earthquake disaster are in Ampelgading, Tirtoyudo, Gedangan, Jabung, Wajak, Wagir, Kasembon, Pujon districts.

d. Forest fire

   Generally the level of forest and land fire capacity shows a still high. But low capacity areas of forest fire are in Ampelgading, Tirtoyudo, Gedangan, Jabung, Wajak, Wagir, Kasembon, Pujon districts.

e. Drought

Drought disaster capacity in Malang Regency is generally high and medium level. The low capacity areas are in Ampelgading, Tirtoyudo, Jabung, Gedangan, Wagir, Pujon districts.

f. Volcano Eruption

Low capacity areas of volcano eruption are in Ampelgading, Tirtoyudo, Jabung, Kasembon, and Pujon districts.

g. Extreme Weather and Tornado

Medium capacity areas of extreme weather and tornado are in Donomulyo, Sumbermanjing Wetan, Bantur, Wajak, Kalipare, and Pagak districts. While low capacity areas are in Ampelgading, Tirtoyudo, Jabung, Wagir, and Pujon districts.

h. Landslide

Medium capacity areas of landslide are in Donomulyo, Sumbermanjing Wetan, Wajak, and Bantur districts. Low capacity areas of landslide are in Ampelgading, Tirtoyudo, Gedangan, Jabung, and Pujon districts.

i. Extreme Wave and Abrasion

Medium capacity areas of extreme wave and abrasion are in Ampelgading, Tirtoyudo, Sumbermanjing Wetan, Gedangan, Bantur, and Donomulyo districts.

After knowing disaster potential in every districts and the region capacity status of each disaster, the next is identify which areas are become the target location of BPBD Malang Regency in implementing the program. This can be seen in the table below:

Table 4.10 Work Realization and Target Location

Year	No.	Activities	Target Location
2014	1	Monitor and dissemination of natural disaster information and Community empowerment by establish and training of Beach Rescue Team	1. Licin Beach, Ampelgading District 2. Lenggoksono Beach, Tirtoyudo District 3. Tamban Beach, Sumbermanjing Wetan District 4. Sendang Biru Beach, Sumbermanjing Wetan District 5. Goa Cina Beach, Gedangan District 6. Bajul Mati Beach, Gedangan District 7. Wonogoro Beach, Gedangan District 8. Balekambang Beach, Bantur District
	2	Socialization of disaster management at school	1. January: SDN Sukoanyar 2, Pakis District 2. February: SDN Jatisari 3, Pakisaji District 3. June: SDN Urek-Urek, Gondanglegi District 4. July: SDN Toyomarto 2, Singosari District 5. August: SDN Dengkol 1, Singosari District 6. September: SDN Sumberkerto 3, Pagak District 7. October: SDN Selorejo 2, Dau District 8. November: SDN Argotirto 2, Sumbermanjing Wetan District 9. December: SDN Jambuwer 1,2,3 Kromengan District
2015	1	Volunteer Capacity Building	Representative of all districts in Malang Regency.
	2	Socialization of disaster management at school	1. January: SDN Kasembon 2 and MI Al-Hidayah, Bululawang District 2. February: SDN Kemiri, Kepanjen District 3. March: SDN Sidodadi 2, Ngantang District 4. April: SDN Karangsuko 1 and SDN Kanigoro 3, Pagelaran District 5. May: SDN Ngebruk 1 and SDN Jatiguwi 1, Sumberpucung District
	3	Workshop of Disaster-Resistant Village	1. Pandansari Village, Ngantang District 2. Tambakrejo Village, Sumbermanjing Wetan District 3. Lebakharjo Village, Ampelgading District
	4	Training of Disaster-Resistant Village volunteers	1. Lebakharjo Village, Ampelgading District 2. Pondokagung Village, Kasembon District

			3. Sumbermanjing Kulon Village, Pagak District 4. Bantuarejo Village, Ngantang District
	5	Seminar of Disaster-Resistant Village	1. Lebakharjo Village, Ampelgading District 2. Pondokagung Village, Kasembon District 3. Sumbermanjing Kulon Village, Pagak District 4. Bantuarejo Village, Ngantang District
	6	Preparation of Kelud Contingency Plan	Malang Regency.
	7	Preparation of Village Information System on disaster	Malang Regency.
	8	Preparation of Regency Disaster Information System (SIKK)	Malang Regency.
2016	1	Monitor and dissemination of natural disaster information	1. January: Wagir, Pakisaji, Kromengan and Sumberpucung District 2. February: Pagak and Kalipare District 3. March: Ngajum and Wonosari District 4. April: Bululawang, Gondanglegi, Wajak and Pagelaran District 5. May: Dampit and Turen District 6. June: Bantur and Sumbermanjing Wetan District 7. July: Sumbermanjing Wetan, Poncokusumo, Ampelgading and Tirtoyudo District 8. August: Wajak and Bantur Districts; 9. September: Ampelgading and Kasembon District 10. October: Pakis and Tirtoyudo District 11. November: Ampelgading, Singosari, Poncokusumo, Jabung, and Tumpang District 12. December: Bantur and Kasembon District
	2	Procurement of disaster prevention facilities and infrastructure	Malang Regency.
	3	Review of Disaster Risk Reduction Plan	Malang Regency.
	4	Capacity building of government personnel in disaster management	Regional Apparatus (TNI, Head of District, Koramil Command, Head of Sector Police) throughout Malang Regency.

	5	Community empowerment in dealing with disaster by establish Disaster-Resistant Village	1. Tamansari Village, Ampelgading District 2. Ngroto Village, Pujon District 3. Ngabab Village, Pujon District 4. Wonokerto Village, Bantur District 5. Karangsari Village, Bantur District 6. Sumberagung Village, Sumbermanjingwetan District 7. Gajahrejo Village, Gedangan District
	6	Socialization of disaster management at school	1. February: SDN Bangelan 1, Wonosari District 2. March: a. SD Ngajum 5, Ngajum District b. SD Sumberpucung 3, Sumberpucung District c. SD Ngadirejo 2, Kromengan District d. SD Sitirejo 4, Wagir District e. SD Kendalpayak, Pakisaji District 2. April: SD Tambakasri 9, Sumbermanjing Wetan District and SD Jambangan, Dampit District 3. May: SD Tlogorejo 3, Pagak District and SD Bantur 6, Bantur District 4. June: SD Sukowilangun 1, Kalipare District and SD Kedok, Turen District 5. July: a. SD Mambul Ulum, Pagelaran District and SD satu atap b. SMP 1 Ngadas, Poncokusumo District 6. August: SD Wonokero 1, Pakisaji District and SD Tambakasri 1, Tajinan District 7. September: SD Tamanharjo 1, Singosari District and SD Wandanpuro 2, Bululawang District 8. October: SD Pujiharjo 2, Tirtoyudo District and SD Tamansari 3, Ampelgading District; 9. November: a. SD Dengkol 2, Singosari District b. SD Saptorenggo 4, Pakis District c. SD Malangsuko 1, Tumpang District 10. December: SD Ngijo 2, Karangploso District and SD Taji 1, Jabung District.
2017	1	Monitor and dissemination of natural disaster information	1. January: Wajak, Sumbermanjing Wetan, Donomulyo, Kasembon, Ngantang and Pujon District

			2. March: Sumberpucung, Wagir and Tajinan District 3. April: Wajak, Tumpang and Donomulyo District 4. June: Sumbermanjing Wetan, Tirtoyudo, Gedangan dan Bantur 5. July: Kecamatan Kasembon and Bantur District 6. August: Sumbermanjing Wetan and Bululawang District 7. September: Sumbermanjing Wetan, Lawang, Bantur and Gedangan District 8. October: Bululawang and Ngantang District 9. November: Bululawang, Poncokusumo, Tirtoyudo, and Ngantang District 10. December: Sumberpucung, Donomulyo and Tirtoyudo District
	2	Procurement of disaster prevention facilities and infrastructure	Malang Regency.
	3	Review of Disaster Risk Reduction Plan	Malang Regency.
	4	Capacity building of government personnel in disaster management	Regional Apparatus (TNI, POLRI, DPMD, Bappeda, BPKAD, Dinsos, Dinkes, Satpol PP and Head of Village) throughout Malang Regency.
	5	Community empowerment in dealing with disaster	1. Tamansatriyan Village, Tirtoyudo District 2. Tulungrejo Village, Ngantang District 3. Pondokagung Village, Kasembon District
	6	Socialization of disaster management at school	1. April: a. MTs Al Fatoni, Poncokusumo District b. MTsN Kepanjen 1, Kepanjen District c. SD Tulung Rejo 1, Ngantang District d. SD Pujon Kidul, Pujon District e. SD Pondok Agung 4, Kasembon District f. SD Tulung Rejo 2, Ngantang District g. SD Bantur 1, Bantur District h. SD Wonorejo 1, Singosari District 2. May: a. SD Pandansari, Poncokusumo District

			b. SD Sumberputih, Wajak District c. Taman Pendidikan Qurotaayun, Kepanjen District d. SD Patokpicis 2, Wajak District 3. July: MTs Alhidayah, Poncokusumo District and MI Iftidaiyah, Poncokusumo District 4. August: SD Sukosari 3, Kasembon District and SD Pandansari 2, Ngantang District 5. September: SD Sekarbanyu 3 Sumbermanjing Wetan District 6. October: SD Sidodadi 1 and SD Sidodadi 3, Lawang District 7. November: a. MI Alhidayah Kasembon Bululawang District b. MI Alfatah Jatisari, Tajinan District c. SD Rowotrate 1, Sumbermanjing Wetan District 8. December: a. SD Sumbersuko 3, Wagir District b. MA NU Alhidayah, Poncokusumo District c. SMP Islam Ashodiq Kuwolu, Bululawang District

Source: Performance Report of BPBD Malang Regency 2014-2017

From the table above can be seen that not all disaster-prone areas in Malang Regency become the target location of BPBD program. For example, in realizing Disaster-Resistant Village, it is carried out gradually and based on the area priority that are very vulnerable to certain disasters. This was stated by staff of Preparedness division:

> *"Semua daerah di Kabupaten Malang ini rawan bencana. Tetapi karena keterbatasan sumber daya BPBD dan dana dari pemerintah pusat, sosialisasi dan pembentukan Desa Tangguh Bencana dilakukan secara bertahap setiap tahun. Kita urutkan dari desa yang paling rawan bencana. Dari 378 desa di Kabupaten Malang, yang menjadi Desa Tangguh Bencana baru 29 desa."*
>
> - Interview with Pak Indra, staff of Prevention and Preparedness division, March 6th, 2018.

(All areas in Malang Regency is prone to disaster. But due to the limited resources of BPBD and budget form central government, the socialization and establishment of Disaster-Resistant Village is executed gradually every year. We sort from the most disaster-prone villages. From 378 villages in Malang Regency, we have 29 Disaster-Resistant Villages.)

More details, 29 Disaster-Resistant Villages that has been formed are:

1. Pujiharjo Village, Tirtoyudo District, formed at 2011;
2. Purwodadi Village, Tirtoyudo District, formed at 2011;
3. Sidoasri Village, Sumbermanjing Wetan District, formed at 2011;
4. Tambakrejo Village, Sumbermanjing Wetan District, formed at 2011;
5. Jatisari Village, Pakisaji District, formed at 2012;
6. Wonorejo Village, Singosari District, formed at 2012;
7. Taji Village, Jabung District, formed at 2012;
8. Duwet Krajan Village, Tumpang District, formed at 2012;
9. Mangliawan Village, Pakis District, formed at 2013;
10. Karangkates Village, Sumberpucung District, formed at 2013;
11. Pait Village, Kasembon District, formed at 2013;
11. Pandansari Village, Ngantang District, formed at 2013;
12. Gedangan Village, Gedangan District, formed at 2014;
13. Sumberringin Village, Wajak District, formed at 2014;
14. Sukomulyo Village, Pujon District, formed at 2014;
15. Sitiarjo Village, Sumbermanjing Wetan District, formed at 2014;
16. Lebakharjo Village, Ampelgading District, formed at 2015;
17. Pondokagung Village, Kasembon District, formed at 2015;
18. Sumbermanjing Kulon Village, Pagak District, formed at 2015;
19. Bantuarejo Village, Ngantang District, formed at 2015;
20. Tamansari Village, Ampelgading District, formed at 2016;
21. Ngroto Village, Pujon District, formed at 2016;
22. Ngabab Village, Pujon District, formed at 2016;
23. Wonokerto Village, Bantur District, formed at 2016;
24. Karangsari Village, Bantur District, formed at 2016;
25. Sumberagung Village, Sumbermanjingwetan District, formed at 2016;
26. Gajahrejo Village, Gedangan District, formed at 2016;
27. Tamansatrian Village, Tirtoyudo District, formed at 2017;
28. Pondokagung Village, Ngantang District, formed at 2017;
29. Tulungrejo Village, Kasembon District, formed at 2017.

4.2.2 Factors that Influence Disaster Risk Reduction Strategy

The challenge that must be faced is to change the paradigm of disaster management from responsive to preventive, that is disaster risk management. This new paradigm needs to be socialized in order to incorporate disaster risk reduction into development policies in order to make an integrated, effective and efficient disaster management mechanism.

Disaster and its impact in Malang Regency is quite dynamic and tends to increase both in intensity and quality. Disaster has a very significant impact on the result of development in the form of infrastructure, property, death, loss and damage to other community assets. However, the problems faced should be viewed as a challenge and opportunity to improve and develop the service of BPBD Malang Regency.

In order to provide a brief presentation, researcher presents data in accordance with some statements that have been indirectly described above, while factors that affect the implementation of disaster risk reduction strategy of BPBD Malang Regency are as follows:

1. Budget

Budget commitment often become influential in organization activities. In the case of disaster risk reduction activities by BPBD Malang Regency, the entire budget is sourced only from Regional Expenditure Budget (APBD). This is a significant influence because often the budget plan proposal is not in line with the approved budget. This was stated by staff of Preparedness division, *"Memang setiap tahun anggaran dana yang kami usulkan selalu dikurangi. Apalagi tahun 2017, anggaran dana dipotong sangat banyak karena pemerintah pusat*

meluangkan anggaran untuk sektor lain." - Interview with Pak Indra, staff of Preparedness division, March 6th, 2018. (Indeed, every year the budget we proposed is always reduced. Especially in 2017, the budget was cut very much because the central government spend the budget for other sectors.)

Table 4.11 Budget of Disaster Risk Reduction Program of BPBD Malang Regency

No.	Activities	Budget			
		2014	2015	2016	2017
1	Monitor and dissemination of natural disaster information	63.335.300	77.564.800	74.000.000	88.800.000
2	Procurement of disaster prevention facilities and infrastructure	-	-	2.636.287.100	177.433.000
3	Review of Disaster Risk Reduction Plan	-	-	40.000.000	100.000.000
4	Capacity building of government personnel in disaster management	-	-	238.400.000	288.400.000
5	Community empowerment in dealing with disaster	92.075.900	92.552.400	50.000.000	148.995.000
6	Socialization of disaster management at school	84.990.300	70.342.800	75.000.000	90.000.000
	TOTAL	**240.401.500**	**240.460.000**	**3.113.687.100**	**893.628.000**
	Average	80.133.800	80.153.300	518.947.850	148.938.000

Source: Performance Report of BPBD Malang Regency 2014-2017

The table above shows that the budget for disaster risk reduction activities tends to rise and fall (fluctuation). Indeed Pak Indra said that the budget cutting can affect the quality of disaster risk reduction activities, but in the implementation of program, BPBD Malang Regency can adjust the realization of activities with approved budget. This can be proved by the achievement of activity that increase every year.

2. Human Resource

Human resource are the main actor in the implementation of each activities. Here is a list of personnel who fill the Division of Prevention and Preparedness of BPBD Malang Regency:

Table 4.12 Personnel of Prevention and Preparedness Division of BPBD Malang Regency

No.	Name	Position
1	Joni Samsul Hadi, ST, MSi	Head of Prevention and Preparedness Division
2	Aprillijanto, SE	Head of Preparedness Subdivision
3	Sadono Irawan, S.Sos	Head of Prevention Subdivision
4	Indra Ermawan	Staff of Preparedness Subdivision
5	Yohan Wicaksono	Staff of Prevention Subdivision

Source: Performance Report of BPBD Malang Regency 2016

Division of Prevention and Preparedness only consists of 5 people, which each division consists of 2 people. This can affect the performance of BPBD Malang Regency because the number of activities often handled by few personnel, and more workload. Stated by staff of Preparedness subdivision, *"Tentu sumber daya manusia yang ada di bidang ini sangat kurang. Lima personil mengurus program kerja yang banyak. Wilayah Kabupaten Malang ini sangat luas. Kami sudah mengajukan permohonan penambahan anggota tetapi belum disetujui."* - Interview with Pak Indra, staff of Preparedness subdivision, March 6th, 2018. (Of course human resources that exist in this division is very less. Five personnel take care of many work programs. Malang Regency area is very wide. We have proposed for additional personnel but have not yet been approved.)

Proposal for additional personnel to Local Government have not been approved, whereas from 2014 to 2017, the lack of human resources is always been

obstacle on Performance Report. However, of course BPBD Malang Regency can overcome this with the establishment of volunteers as working partners who assist disaster risk reduction activities and protect the community when disaster occur.

3. Cooperation with Other Parties

Third party involvement has a significant impact on the implementation of disaster risk reduction. This was stated by staff of Preparedness subdivision, *"BPBD Kabupaten Malang tidak mungkin bisa berdiri sendiri. Karena keterbatasan kemampuan, kami menggandeng beberapa lembaga yang menjadi partner kami dalam melaksanakan program. Perannya bukan pemberi hibah dana, melainkan sebagai fasilitator dan hibah peralatan."* - Interview with Pak Indra, staff of Preparedness subdivision, March 6th, 2018. (BPBD Malang Regency cannot stand alone. Due to our limited ability, we are partnering with several institutions to become our partners in implementing the programs. Its role is not the money granter, but mostly as facilitator and equipment granter).

4.3 Analysis and Interpretation

Disaster is greatly affect government efforts in achieving regional development targets that has been planned. This condition need to be prevented and anticipated as early as possible. If a pre-disaster program can be carried out systemically, it is expected to contribute directly or indirectly to the acceleration of disaster mitigation and minimize the possibility of more severe damages to development assets that owned by community. This is because systemic disaster management can help to recover social, cultural, and economic resilience of community to face disaster and improve their environmental condition. Moreover

today, the disaster management paradigm that emphasizes on the emergency response has shifted to disaster risk management paradigm, it has the competence to realize sustainable and environmentally development. Along with the change of disaster management paradigm in Malang Regency that has been shifted, disaster management no longer emphasize on emergency aspect, but more emphasize on overall disaster risk management.

The task of BPBD is a contradictory task. They handle the disaster which is not expected by everyone including BPBD itself. BPBD of Malang Regency carrying the tasks for disaster-affected community must change the paradigm in disaster management from responsive to preventive. In the perspective of new paradigm, disaster management becomes one of the national development priorities in National Medium Term Development Plan (RPJMN) 2015-2019, so BPBD of Malang Regency is responsible to respond the uncontrolable disaster challenges with real policy and program, so disaster risk that arises can be minimized.

4.3.1 Strategy of Disaster Risk Reduction

Disaster risk reduction is an important action that needs to be reviewed, a disaster risk reduction strategy is needed in order to run it well and directed. In accordance with the concept, disaster risk reduction action has many indicators from various expert opinions. Local Regulation of Malang Regency No. 4 of 2011 explains that disaster risk reduction becomes activity to overcome disaster. In this case the government through BPBD has provided support in providing legal regulation for disaster risk reduction. Disaster risk reduction by BPBD has its own provision set out in various planning documents, such as Medium Term Development Plan (RPJMD), Strategic Plan of Badan Penanggulangan Bencana

Daerah (Renstra), Disaster Management Plan (RPB), and Regional Action Plan (RAD).

The strategy of BPBD Malang Regency analyzed by the approach that has been set by researcher which is thematic, holistic, integrative and spatial (THIS) approach by Bappenas. More detail is explained in the framework flowchart below:

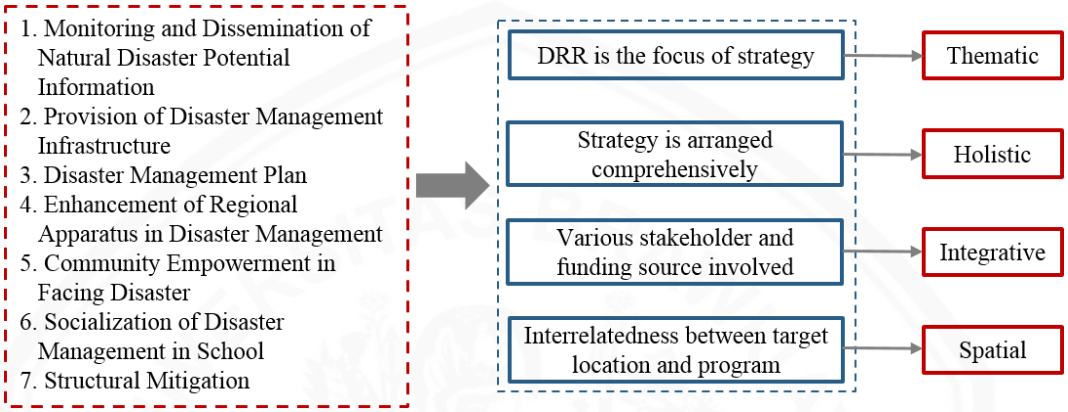


Figure 4.9 Framework of DRR Strategy and THIS Approach
Source: processed by Researcher, 2018

There are two types of disaster risk reduction or can called mitigation, those are structural and nonstructural mitigation. Purnomo & Sugiantoro (2010: 23) explains that:

a. Structural Mitigation is a risk reduction effort undertaken through development or changes in the physical environment. These efforts include the construction of houses, bridges, land, detection systems, and handling of infrastructure for safety living.
b. Non-structural mitigation is risk reduction through the modification of human behavior processes. In this technique includes regulation, education programs, and public awareness.

Presentation of data that researcher has described, indicating that the type of disaster risk reduction conducted by BPBD Malang Regency mostly is

nonstructural mitigation. Stated in Strategic Plan of BPBD Malang Regency 2016-2021, disaster risk reduction strategies include:

a. Increase the number of Disaster-Resistant Villages;
b. Improve socialization of disaster;
c. Improve community empowerment;
d. Improve Public Satisfaction Index of disaster services.

Then that carry out the structural mitigation is another agency. Disaster risk reduction in Malang Regency is the responsibility of Badan Penanggulangan Bencana Daerah of Malang Regency. However, this cannot be separated from related agencies of disaster prevention in Malang Regency. Agencies that implement structural mitigation can be seen in the following table:

Table 4.13 Role of Local Government Agency in Disaster Sector

No	Agency	Role
1	Dinas Pekerjaan Umum of Malang Regency	Plan, control and set up the location and routes of evacuation, recovery needs of public facilities / infrastructure, provision of emergency facilities, coordination of housing construction for disaster victim and implement infrastructure development in accordance with spatial plan on disaster sensitive regional.
2	Dinas Perhubungan of Malang Regency	Plan and carry out the support for transportation, communication and information needs.
3	Badan Perencanaan Pembangunan Daerah of Malang Regency	Plan, monitor and evaluation of disaster risk sensitive development programs with relevant agencies.

Source: Disaster Management Plan of Malang Regency 2015-2019

4.3.1.1 Thematic Approach

Keyword of thematic approach is policy related to disaster risk reduction being the focus and emphasis in the planning document (Bappenas, 2017: 29). This condition is marked by the number of programs and activities in planning document related to disaster

risk reduction. The documents are Strategic Plan of BPBD Malang Regency 2016-2021 and the annual plan document which is Work Plan of BPBD Malang Regency. Actually it is clearly stated in the Strategic Plan of BPBD Malang Regency 2016-2021 that disaster risk reduction becomes the focus of BPBD in conducting disaster management. But to ensure this statement, researcher reviews the program that have been implemented by BPBD of Malang Regency.

From all disaster management activities that set by BPBD Malang Regency, Prevention and Preparedness Division, which holds pre-disaster program, is the division with the most program, which is 6 programs. The disaster risk reduction programs set out in the Strategic Plan 2016-2021 are:

a. Monitor and dissemination of natural disaster information
b. Procurement of disaster prevention facilities and infrastructure
c. Review of Disaster Risk Reduction Plan
d. Capacity building of government personnel in disaster management
e. Community empowerment in dealing with disaster
f. Socialization of disaster management at school.

In addition, to know the effort of BPBD Malang Regency in implementing disaster risk reduction as a priority action is by identify achievement and performance realization from year to year. As can be seen in the table below:

Table 4.14 Comparison of Work Achievements of BPBD Malang Regency

Year	Strategic Target	Performance Indicator	Target	Achievement	Realization
2012	Reduce disaster risk at the community and increase the dissemination of disaster information	Ratio of Capacity building on disaster-prone areas • Monitor and Dissemination of disaster prone areas • Workshop of volunteer capacity building in disaster prone areas and Disaster Management Socialization at school	0.028%	100%	0.028%
	Socialization of community understanding and awareness to face disaster				

2013	Reduce disaster risk at the community and increase the dissemination of disaster information Socialization of community understanding and awareness to face disaster	Ratio of Capacity building on disaster-prone areas • Monitor and Dissemination of disaster prone areas • Workshop of volunteer capacity building in disaster prone areas and Disaster Management Socialization at school	0.032%	100%	0.032%
2014	Reduce disaster risk at the community and increase the dissemination of disaster information Socialization of community understanding and awareness to face disaster	Ratio of Capacity building on disaster-prone areas • Monitor and Dissemination of disaster prone areas • Workshop of volunteer capacity building in disaster prone areas and Disaster Management Socialization at school	65 %	102.57%	66.67%
2015	Realization of Community Empowerment in prevention and preparedness of disaster that good and optimal	Percentage of disaster capacity improvement in disaster-prone areas	70 %	104.3%	73 %
2016	Realization of Community Empowerment in prevention and preparedness of disaster that good and optimal	Percentage of disaster capacity improvement in disaste-prone areas	75%	101%	75.75%
2017	Realization of Community Empowerment in prevention and preparedness of disaster that good and optimal	Percentage of disaster capacity improvement in disaster-prone areas	77%	100%	77%

Source: processed by Researcher from Performance Report of BPBD Malang Regency 2013-2017

The table above can explain that the realization of disaster risk reduction activities by BPBD Malang Regency always increase from year to year. And the achievements were always 100% even more. Percentage of pre-disaster performance achievements are always higher than emergency and post-disaster activities. It shows that BPBD Malang Regency is committed to always expand and increase the coverage of disaster risk reduction activities in Malang Regency. More briefly, the achievement can be seen in the diagram below:

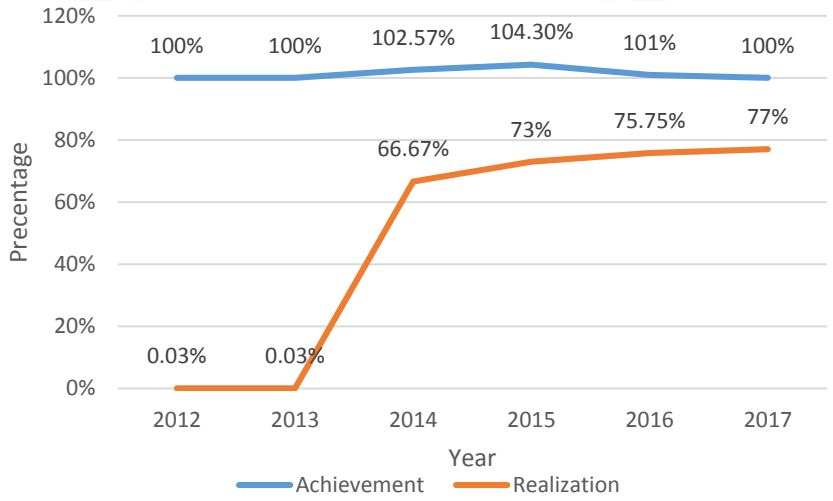


Figure 4.10 Achievement and Realization of Disaster Risk Reduction Program
Source: processed by Researcher, 2018

The core of above explanation are 1) Disaster risk reduction has been declared as the main focus of disaster management activities in Strategic Plan of BPBD Malang Regency 2016-2021; 2) The quantity of disaster risk reduction programs is more than the emergency and post-disaster programs which is 6 programs out of 12 programs; 3) The realization of disaster risk reduction programs always increase every year from 0.028% in 2012 to 77% in 2017. All of above interpretation and explanation can conclude that disaster risk reduction becomes the focus on disaster management strategy by BPBD Malang Regency.

That is in line with one of the priority actions of Hyogo Framework Action 2005-2015 that disaster risk reduction agenda should be a regional priority. The priority actions of Hyogo Framework Actions (UNISDR, 2005: 4-12) are:

1. Ensure disaster risk reduction as a national and local priority
2. Identify, assess and monitor disaster risk and improve early warning
3. Utilize knowledge, innovation and education to build resilience
4. Reduce the underlying risk factors
5. Strengthen disaster preparedness for effective response.

As the disaster risk reduction agenda becomes the focus or emphasis in the planning documents, as well as many programs related to disaster risk reduction, it can be stated that disaster risk reduction strategy of Badan Penanggulangan Bencana Daerah of Malang Regency is thematic.

4.3.1.2 Holistic Approach

Disaster issues are complex and interrelated. With the complexity of issues, a comprehensive solution is needed. Therefore, the review of disaster risk reduction strategy can be done by looking at whether the programs and activities have answer the factors that causing high risk of disaster. In asses holistic planning, it needs review the relevance of activities with disaster risk reduction. As in the table below:

Table 4.15 Review The Relevance of Disaster Dimension

No	Activities	Disaster Dimension		
		Risk Reduction	Emergency Response	Rehabilitation and Reconstruction
1	Monitor and Dissemination of Natural Disaster Information	√		
2	Procurement of Disaster Prevention Facilities and Infrastructure	√		
3	Review of Disaster Risk Reduction Plan	√		
4	Capacity Building of Government Personnel in Disaster Management	√		
5	Community Empowerment in Dealing with Disaster	√		

6	Socialization of Disaster Management at School	√		
7	Capacity Building for Disaster Handling and Logistics		√	
8	Development Activities of Regional Disaster Management System		√	
9	Improve Emergency Handling		√	
10	Emergency Response in Affected Areas		√	
11	Strengthen and Operation of Emergency Response Command System		√	
12	Rehabilitation and Reconstruction of Damaged Infrastructure			√
13	Recovery Of Socio-Economic, Cultural and Psychological			√
14	Upgrade Facilities and Infrastructure Adapt with Disaster			√
15	Structural Mitigation	√		

Source: processed by Researcher from Work Plan of BPBD Malang Regency 2017

The table above is used to identify what activities are relevant to the disaster dimension. The table shows that 7 activities of BPBD Malang Regency are relevant to dimension of disaster risk reduction. From 15 activities of BPBD Malang Regency, 5 activities included into the dimension of emergency response and 3 other activities are dimension of rehabilitation and reconstruction.

After identify the relevance of disaster dimension, the programs that belongs to dimension of risk reduction are reviewed by the relevance of DRR indicators. To identify the relevance, researcher use the indicators of disaster preparedness framework from Twigg (2015: 301-302), namely:

1. Vulnerability, hazard and risk assessment
   Starting point for planning and preparation, linked to longer-term mitigation and development interventions as well as disaster preparedness.
2. Planning
   Disaster preparedness plans agreed and in place, which are achievable and for which commitment and resources are assured.

3. Institutional framework
   Well-coordinated disaster preparedness and response system at all levels, with commitment from relevant stakeholders. Roles and responsibilities clearly defined.
4. Information systems
   Efficient and reliable systems for gathering and sharing information between stakeholders (e.g. forecasts and warnings, information on relevant capacities, role allocation and resources).
5. Resource base
   Goods (e.g. stockpiles of food, emergency shelter and other materials), services (e.g. search and rescue, medical, engineering, nutrition specialists) and disaster relief funding (e.g. for items not easily stockpiled or not anticipated) available and accessible.
6. Warning systems
   Robust communications systems (technologies, infrastructure, people) capable of transmitting warnings effectively to people at risk.
7. Response mechanisms
   Established and familiar to disaster response agencies and disaster victims (may include evacuation procedures and shelters, search and rescue teams, needs assessment teams, activation of emergency lifeline facilities, reception centres and shelters).
8. Education and training
   Training courses, workshops and extension programmes for at-risk groups and disaster responders. Knowledge of risk and appropriate response shared through public information and education systems
9. Rehearsals
   Evacuation and response procedures practised, evaluated and improved.

So the relevance of disaster risk reduction programs of BPBD Malang Regency can refer to the table below:

Table 4.16 Relevance of BPBD Programs to Disaster Preparedness Framework

No	Activities	Disaster Preparedness Framework								
		Risk Assessment	Planning	Institutional Framework	Information System	Resource Base	Warning System	Response Mechanism	Education and Training	Rehearsals
1	Monitor and Dissemination of Natural Disaster Information				√	√	√	√		
2	Procurement of Disaster Prevention Facilities and Infrastructure				√	√	√	√		

3	Review of Disaster Risk Reduction Plan	√	√	√	√					
4	Capacity Building of Government Personnel in Disaster Management			√	√		√	√	√	√
5	Community Empowerment in Dealing with Disaster			√	√		√	√	√	√
6	Socialization of Disaster Management at School			√	√			√	√	√
7	Structural Mitigation					√	√			

Source: Interpretation of Researcher, 2018

The table above shows that pre-disaster activities of Badan Penanggulangan Bencana Daerah of Malang Regency meets all the indicators of disaster preparedness framework stated by Twigg (2015: 302). The entire program also suitable with priority agenda of Sendai Framework for Disaster Risk Reduction, those are:

1. Understanding disaster risks
2. Strengthening governance and institutions in disaster risk management
3. Investing resilience in economic, social, cultural and environmental
4. Increasing preparedness, response and recovery at all levels.

The next is identify whether the disaster risk reduction programs of BPBD Malang Regency can answer the high disaster risk problem in Malang Regency. Certainly, the current disaster risk status is cannot be explained because disaster risk assessment is conducted after 2019 following the period of Disaster Management Plan 2015-2019. However, reviewing the entire disaster risk reduction programs of BPBD Malang Regency, 4 programs aimed to improve the capacity of government apparatus and community, which is the impact can be directly felt. Of course, capacity building can reduce vulnerability then influence the disaster risk index. As stated by Nurjannah (2012), if people are familiar with disaster and its

characteristics, also their ability to handle disaster, then the level of community vulnerability is low.

All the above explanation concluded, that disaster risk reduction programs of BPBD Malang Regency fulfill all disaster preparedness framework. Then, the entire program improves community capacity on disaster and reduces disaster risk index. Based on the comprehensive program structure and observement of current problem condition, it can be said that disaster risk reduction strategy of BPBD Malang Regency is holistic.

4.3.1.3 Integrative Approach

No single group or organization can address every aspect of DRR. The scale, frequency and complexity of disaster, as both physical and social phenomena, can only be addressed by deploying a wide range of knowledge, skills, methods and resources. Therefore, risk reduction initiatives should be multi-disciplinary partnerships, enabling organizations to share ideas, work more coherently, deliver projects more effectively and influence decision-makers. Partnerships should increase the impact of initiatives by making them more sustainable and replicable. Forming alliances can also make better use of resources. Partnerships can be both vertical (between national and more local actors) and horizontal (e.g. between government, private sector and civil society).

The integrative approach analyzes the integration of actors and funding sources (Bappenas, 2017: 32). It consists of who is the implementer and what kind of budget that disaster risk reduction activities used. In identifying that, it is important to note that disaster risk reduction activities of BPBD Malang Regency

have involved all stakeholders, such as central government, local government, private and community.

The data that researcher has been presented, shows that there are many actors in the implementation of disaster risk reduction programs. The actors involved are central government (National Disaster Management Agency), local government, other relevant government agencies, society, State-Owned Enterprises, Non-Governmental Organizations and international agencies. The role of various stakeholders is of course different. There is formed and co-operated directly by BPBD Malang Regency, there is a support from central government.

The funding source for disaster risk reduction programs of BPBD Malang Regency is only from Regional Expenditure Budget. This means that funding source of BPBD Malang Regency is not varied. Whereas Malang Regency has the potential of various disaster types, it is necessary to build fiscal and financial resilience based on the various financial strategy suitable with the frequency and disaster level. Another thing that needs to be developed is to form a network of government partnerships with private sector in developing financial strategy. This should be part of the main agenda in disaster risk reduction.

There are many stakeholders of disaster risk reduction in Malang Regency, their role is different. Badan Nasional Penanggulangan Bencana (BNPB) as the central coordinator of disaster management has been a facilitator of Disaster-Resistant Village in 2015. United Nations Development Program (UNDP) has been a facilitator in making Contingency Plan of Kelud Lava, Village Disaster Information System and Regency Disaster Information System in 2015. Australian Agency for International Development (AusAID), United States Agency for

International Development (USAID) and Nahdlatul Ulama Institute for Disaster Management and Climate Change have facilitated the preparation of Disaster Management Plan 2015-2019. Bank Jatim has also provided tankers in 2016 and 2017 for clean water distribution. Community groups that approximately 1250 people consists of Rapid Response Team, Disaster Management Unit, and Beach Rescue Team are active as a working partner or second marketers in disseminating disaster risk reduction to the community.

Due to less personnel of Prevention and Preparedness division in BPBD Malang Regency, working with community group is one of the best ways to maximize disaster risk reduction efforts. As expressed by Twigg (2015: 115):

> Working closely with local people helps professionals to gain greater insight into the communities, enabling them to work more effectively and produce better results. Community-Based Disaster Risk Management reinforces local organization, building up skills, capacity, and awareness. In this way, it increases people's potential for reducing their vulnerability.

In addition, funding source that is not varied make BPBD Malang Regency only depend on one funding source that is APBD. Therefore, local government needs to find a solution of this problem by involving various relevant stakeholders in the implementation of development, for example the private sector. The involvement of various private parties has an important role to help government in financial availability. According to Parente in Aziz (2016) there are three things that encourage the government to engage in government and private partnership, its due to limited funding, efficiency and effectiveness of government, also government responsibility to society. As organization that has responsibility to save people's life, BPBD Malang Regency cannot only depend on APBD. They needs

to attract private parties to make investments to support disaster risk reduction agenda in order to increase community prosperity.

The meaning of integrative approach is the more stakeholders involved and the more varied funding sources that support them, the disaster risk reduction strategy can be summed up as an integrative strategy. The explanation of funding sources and the involvement of several stakeholders as the implementer of disaster risk reduction activities can be stated that disaster risk reduction strategy of BPBD Malang Regency is not integrative yet. In terms of stakeholder involvement, there are many actors involved from international into village level. However, the funding source has not varied.

4.3.1.4 Spatial Approach

The linkage of location and integrated activities is the key to spatial approach (Bappenas, 2017: 31). This means that every program and activity that has been prepared has a functional relationship with its location. Researcher interprets that by connecting the disaster-prone district with the location of disaster risk reduction program by BPBD Malang Regency. It can be seen in the table below:

Table 4.17 Interrelatedness of Location and Disaster Risk Reduction Program of BPBD Malang Regency

No	District	Risk Condition	BPBD Programs	Year
1	Kasembon	• 8 disaster potentials • Low capacity to earthquake, forest fire, volcano eruption	1. Workshop of Disaster-Resistant Village 2. Monitor and dissemination of natural disaster information (3 Disaster-Resistant Villages) 3. Monitor and dissemination of natural disaster information	2015 2016 2017

			4. Community empowerment by establish Disaster-Resistant Village 5. Socialization of disaster management at school (3 schools)	
2	Ngantang	• 8 disaster potentials • Low capacity to floods	1. Monitor and dissemination of natural disaster information 2. Workshop of Disaster-Resistant Villages 3. Seminar of Disaster-Resistant Villages (3 Disaster-Resistant Villages) 4. Monitor and dissemination of natural disaster information 5. Community empowerment by establish Disaster-Resistant Village 6. Socialization of disaster management at school (3 schools)	2015 2017
3	Dau	8 disaster potentials	Socialization of disaster management at school	2014
4	Wagir	• 8 disaster potentials • Low capacity to earthquake, forest fire, drought, extreme weather, and tornado	1. Monitor and dissemination of natural disaster information 2. Socialization of disaster management at school 3. Monitor and dissemination of natural disaster information 4. Socialization of disaster management at school	2016 2017
5	Wonosari	8 disaster potentials	1. Monitor and dissemination of natural disaster information 2. Socialization of disaster management at school	2016
6	Ngajum	8 disaster potentials	1. Monitor and dissemination of natural disaster information	2016

			2. Socialization of disaster management at school	
7	Pakisaji	4 disaster potentials	1. Socialization of disaster management at school 2. Monitor and dissemination of natural disaster information (1 Disaster-Resistant Villages) 3. Socialization of disaster management at school (2 schools)	2014 2016
8	Kromengan	7 disaster potentials	1. Socialization of disaster management at school 2. Monitor and dissemination of natural disaster information 3. Socialization of disaster management at school	2014 2016
9	Sumberpucung	7 disaster potentials	1. Socialization of disaster management at school (2 schools) 2. Monitor and dissemination of natural disaster information (1 Disaster-Resistant Villages) 3. Socialization of disaster management at school 4. Monitor and dissemination of natural disaster information	2015 2016 2017
10	Kalipare	• 7 disaster potentials • Medium capacity to extreme weather and tornado	Monitor and dissemination of natural disaster information	2016
11	Donomulyo	8 disaster potentials	Monitor and dissemination of natural disaster information	2017
12	Pagak	• 7 disaster potentials • Medium capacity to extreme	1. Socialization of disaster management at school 2. Seminar Disaster-Resistant Villages (1 Disaster-Resistant Villages)	2014 2015

		weather and tornado	3. Monitor and dissemination of natural disaster information 4. Socialization of disaster management at school	2016
13	Kepanjen	4 disaster potentials	1. Socialization of disaster management at school 2. Socialization of disaster management at school (2 schools)	2015 2017
14	Bantur	• 8 disaster potentials • Medium capacity to extreme weather and tornado, landslide, extreme wave and abrasion	1. Monitor and dissemination of natural disaster information; Community empowerment by establish and training of Beach Rescue Team 2. Monitor and dissemination of natural disaster information 3. Community empowerment by establish Disaster-Resistant Village (2 Disaster-Resistant Villages) 4. Socialization of disaster management at school 5. Monitor and dissemination of natural disaster information 6. Socialization of disaster management at school	2014 2016 2017
15	Gedangan	• 8 disaster potentials • Low capacity to flood, earthquake, forest fire, drought, landslide, extreme wave and abrasion	1. Monitor and dissemination of natural disaster information; Community empowerment by establish and training of Beach Rescue Team 2. Community empowerment by establish Disaster-Resistant Village (2 Disaster-Resistant Villages) 3. Monitor and dissemination of natural disaster information	2014 2016 2017

16	Sumbermanjing Wetan	• 8 disaster potentials • Medium capacity to extreme weather and tornado, landslides, extreme waves and abrasion	1. Monitor and dissemination of natural disaster information; Community empowerment by establish and training of Beach Rescue Team 2. Socialization of disaster management at school 3. Workshop of Disaster-Resistant Villages 4. Monitor and dissemination of natural disaster information 5. Community empowerment by establish Disaster-Resistant Village (4 Disaster-Resistant Villages) 6. Socialization of disaster management at school 7. Monitor and dissemination of natural disaster information 8. Socialization of disaster management at school (2 schools)	2014 2015 2016 2017
17	Pagelaran	4 disaster potentials	1. Socialization of disaster management at school (2 schools) 2. Monitor and dissemination of natural disaster information 3. Socialization of disaster management at school (2 schools)	2015 2016
18	Gondanglegi	4 disaster potentials	1. Socialization of disaster management at school 2. Monitor and dissemination of natural disaster information	2014 2016
19	Turen	7 disaster potentials	1. Monitor and dissemination of natural disaster information 2. Socialization of disaster management at school	2016

20	Dampit	7 disaster potentials	1. Monitor and dissemination of natural disaster information 2. Socialization of disaster management at school	2016
21	Tirtoyudo	• 8 disaster potentials • Low capacity to flood, tsunami, earthquake, forest fire, drought, volcano eruption, extreme weather and tornado, landslides, extreme wave and abrasion	1. Monitor and dissemination of natural disaster information; Community empowerment by establish and training of Beach Rescue Team 2. Monitor and dissemination of natural disaster information (3 Disaster-Resistant Villages) 3. Socialization of disaster management at school 4. Monitor and dissemination of natural disaster information 5. Community empowerment by establish Disaster-Resistant Village	2014 2016 2017
22	Ampelgading	• 9 disaster potentials • Low capacity to flood, tsunami, earthquake, forest fire, drought, volcano eruption, extreme weather and tornado, landslide, extreme wave and abrasion	1. Monitor and dissemination of natural disaster information; Community empowerment by establish and training of Beach Rescue Team 2. Workshop of Disaster-Resistant Villages 3. Seminar of Disaster-Resistant Villages 4. Monitor and dissemination of natural disaster information 5. Community empowerment by establish Disaster-Resistant Village (2 Disaster-Resistant Villages) 6. Socialization of disaster management at school	2014 2015 2016 2017
23	Bululawang	4 disaster potentials	1. Socialization of disaster management at school (2 schools)	2015

			2. Monitor and dissemination of natural disaster information 3. Socialization of disaster management at school 4. Monitor and dissemination of natural disaster information 5. Socialization of disaster management at school (2 schools)	2016 2017
24	Wajak	• 7 disaster potentials • Low capacity to earthquake, forest fire, extreme weather and tornado, landslide	1. Monitor and dissemination of natural disaster information (1 Disaster-Resistant Villages) 2. Monitor and dissemination of natural disaster information 3. Socialization of disaster management at school (2 schools)	2016 2017
25	Tajinan	4 disaster potentials	1. Socialization of disaster management at school 2. Monitor and dissemination of natural disaster information 3. Socialization of disaster management at school	2016 2017
26	Poncokusumo	• 8 disaster potentials • Low capacity to flood	1. Monitor and dissemination of natural disaster information 2. Socialization of disaster management at school 3. Monitor and dissemination of natural disaster information 4. Socialization of disaster management at school (5 schools)	2016 2017
27	Tumpang	7 disaster potentials	1. Monitor and dissemination of natural disaster information (1 Disaster-Resistant Villages) 2. Socialization of disaster management at school	2016

			3. Monitor and dissemination of natural disaster information	2017
28	Jabung	• 8 disaster potentials • Low capacity to earthquake, forest fire, drought, volcano eruption, extreme weather and tornado, landslide	1. Monitor and dissemination of natural disaster information (1 Disaster-Resistant Villages) 2. Socialization of disaster management at school	2016
29	Pakis	7 disaster potentials	1. Socialization of disaster management at school 2. Monitor and dissemination of natural disaster information (1 Disaster-Resistant Villages) 3. Socialization of disaster management at school	2014 2016
30	Singosari	7 disaster potentials	1. Socialization of disaster management at school (2 schools) 2. Monitor and dissemination of natural disaster information (1 Disaster-Resistant Villages) 3. Socialization of disaster management at school (2 schools) 4. Socialization of disaster management at school	2014 2016 2017
31	Lawang	7 disaster potentials	1. Monitor and dissemination of natural disaster information 2. Socialization of disaster management at school	2017
32	Karangploso	6 disaster potentials	Socialization of disaster management at school	2016
33	Pujon	• 9 disaster potentials • Low capacity to earthquake, forest fire, drought,	1. Community empowerment by establish Disaster-Resistant Village (3 Disaster-Resistant Villages)	2016

		volcano eruption, extreme weather and tornado, landslide	2. Monitor and dissemination of natural disaster information 3. Socialization of disaster management at school	2017

Source: processed by Researcher, 2018

The table above shows the amount of disaster potential and disaster capacity status in each district, then paired with disaster risk reduction programs of BPBD Malang Regency. From the table can be seen that in determining the target location for disaster risk reduction programs conducted by BPBD Malang Regency, is right on target. It means that the programs are implemented in location with disaster potential and targeted in low and medium capacity districts. So, there is a functional linkage between location and disaster risk reduction program. If adapted to the spatial approach by Bappenas (2017: 32) then Disaster Risk Reduction Strategy of BPBD Malang Regency is a regional-based strategy (spatial).

However, in terms of priority, according to researcher it is still considered less. Such as Wagir, Gedangan, Wajak and Jabung districts. That four sub-districts have low capacity for many types of disaster, but the programs realization are not balanced with areas with medium capacity. Even Wagir district, which has 8 disaster potentials and low capacity for 5 types of disaster, does not have Disaster-Resistant Village. In contrast to Pagak, Bantur, and Sumbermanjing Wetan districts. That three sub-districts do have a lot of disaster potentials, their capacity is medium, but became the target location for many BPBD programs. Even Sumbermanjing Wetan district has 4 Disaster-Resistant Villages. These condition should get more attention and become a consideration for BPBD Malang Regency in determining the target location for every disaster risk reduction program.

4.3.2 Factors that Influence Disaster Risk Reduction Strategy

In the process of disaster risk reduction strategy of BPBD Malang Regency there are several factors that influence the implementation, which is in accordance with the result of interview and documentation that researcher did, and has been presented in the presentation of data. The factors that influence disaster risk reduction implementation are:

1. Budget Commitment

   Budget is an important role to supports the implementation of disaster risk reduction strategy, because even good activity without a fixed budget plan will not support the implementation of such activities. As stated by Terry in Siagian (2004: 25) that management elements are man, material, machine, method, money and market. So far, the budget of program implementation that sourced from APBD is sufficient, because BPBD Malang Regency can implement the program suitable with the approved performance plan. So in this case, the budget commitment is very influential in the implementation of disaster risk reduction strategy of BPBD Malang Regency.

   However, when it comes to big expectations, it is better to increase the amount of budget for disaster risk reduction activities to be more massive and maximized. Then BPBD of Malang Regency should be in cooperation with the private sector, as indicated by integrative approach by Bappenas (2017: 32), that more varied funding sources and stakeholders are involved, the strategy is an integrative strategy. Therefore it needs to be a concern of BPBD Malang Regency and Local Government.

According to Parente in Aziz (2016), there are three things that support the government to engage in government and private partnership, its due to the limited funding, efficiency and effectiveness of government, also government responsibility to society. Therefore BPBD Malang Regency should not depend on one funding source, it is necessary cooperation with private parties by encourage them to implement their Corporate Social Responsibility for disaster sector in Malang Regency.

2. Human Resource

BPBD Malang Regency cannot only rely on personnel of Prevention and Preparedness division in carrying out disaster risk reduction activities. The area of Malang Regency is very wide and many society are at risk to disaster exposure, so it requires an immediate and qualified empowerment program, so that more people are aware and resilient to disaster. However, these goals are not supported by balance number of personnel. The recruitment of disaster preparedness officers and the formation of volunteers is very helpful for BPBD Malang Regency in implementing the program. According to Twigg (2015: 115), the scale, frequency and complexity of disasters, as both physical and social phenomena can be addressed by deploying a wide range of knowledge, skills, methods and resources. Thus, the condition of BPBD Malang Regency personnel is now inconsistent with Twigg's statement. So the lack of personnel inhibits the effectiveness and efficiency of disaster risk reduction activities. However, additional human resources surely support BPBD Malang Regency to implement the disaster risk reduction strategy. Which, they are not the target objects but the community groups that actively empower other communities to expand the benefits achieved.

In conclusion, human resources are inhibiting factors as well as supporting factors in disaster risk reduction strategy of BPBD Malang Regency.

3. Cooperation with Other Parties

The capacity of BPBD Malang Regency in terms of equipment inventory and personnel capability have limitations. Such limitations reduce the quality of disaster risk reduction programs. For example case is now disaster risk reduction become a national action that must be implemented to achieve community resilience. However BPBD Malang Regency who responsible for that do not have capacity to measure the threat, vulnerability, and region capacity. Then BPBD Malang Regency asks institutions that engaged in the same sector such as Australian Aid, USAID, and LPB NU as a working partner to cover the limitations of BPBD Malang Regency. As well as the equally important is Rapid Response Team consist of universities, non-governmental organizations and related government agencies as additional resources that support disaster risk reduction activities. The involvement of those institutions in BPBD Malang Regency programs is in line with the new paradigm in governance, namely sound governance, said by Putra (2009: 7) that there are 4 actors in sound governance namely government, society, business sector, and international actors.

CHAPTER 5

CONCLUSION AND SUGGESTION

5.1 Conclusion

Based on data presentation and data analysis that have researcher described on previous chapter, so far the disaster risk reduction strategy by Badan Penanggulangan Bencana Daerah of Malang Regency almost meets the criteria of thematic, holistic, integrative and spatial approach established by Badan Perencanaan Pembangunan Nasional. Disaster risk reduction strategy of BPBD Malang Regency consists of the following programs:

1) Monitor and Dissemination of Natural Disaster Information
2) Procurement of Disaster Prevention Facilities and Infrastructure
3) Review of Disaster Risk Reduction Plan
4) Capacity Building of Government Personnel in Disaster Management
5) Community Empowerment in Dealing with Disaster
6) Socialization of Disaster Management at School
7) Structural Mitigation

The result of analysis, researcher concludes that disaster risk reduction strategy seen from THIS approach is:

1. Thematic Approach

   Disaster risk reduction strategy of BPBD Malang Regency is a thematic strategy, because disaster risk reduction becomes the focus in the planning document. Proven by 6 out of all 12 programs of BPBD Malang Regency are programs of disaster risk reduction. In addition, disaster risk reduction has been declared as the main focus of disaster management in the Strategic Plan of BPBD Malang Regency 2016-2021. The realization of disaster risk reduction programs is also increasing every year from 0.028% in 2012 to 77% in 2017.

2. Holistic Approach

   Disaster risk reduction strategy of BPBD Malang Regency is a holistic strategy, because disaster risk reduction program is developed comprehensively in planning document. This proven by the entire disaster risk reduction programs of BPBD Malang Regency meet the indicators of disaster preparedness framework by Twigg (2015), namely: Vulnerability, hazard and risk assessment; Planning; Institutional framework; Information systems; Resource base; Warning systems; Response mechanisms; Education and training; and Rehearsals. In addition, disaster risk reduction program of BPBD Malang Regency suitable with the priority action of Sendai Framework for Disaster Risk Reduction 2015-2030, those are: Understanding disaster risk; Strengthening governance and institutions in disaster risk management; Investing resilience in economic, social, cultural and environmental; Increasing preparedness, response and recovery at all levels.

3. Integrative Approach

   Disaster risk reduction strategy of BPBD Malang Regency is not fully integrative, because the funding source is not varied, although its implementation have involved all levels of stakeholder. It is explained that the stakeholders involved are central government, international institutions, private, and community groups. However, the funding source of program only comes from one source that is Regional Expenditure Budget.

4. Spatial Approach

   Disaster risk reduction strategy of BPBD Malang Regency is a territorial-based strategy, because of the interrelatedness between location and various

integrated activities. Proven with disaster risk reduction program of BPBD Malang Regency is implemented in areas that have various types of disaster potential with low and medium capacity level.

Then from the presentation and analysis of data, factors that influence the implementation of disaster risk reduction strategy of BPBD Malang Regency are:

1. Budget Commitment

   Budget is an important material in program implementation. In this case, all program budget are sourced from Regional Expenditure Budget as supporting item in the implementation of disaster risk reduction program of BPBD Malang Regency. Budget that only come from one source makes BPBD Malang Regency depends to only one party. Which is the criteria of integrative approach is the more varied funding sources and stakeholders are involved, the strategy is an integrative strategy.

2. Human Resources

   The number of personnel only 5 people in a division is an obstacle to increase the target, whereas disaster risk reduction is now a priority agenda. However, additional human resources surely support BPBD Malang Regency to implement the disaster risk reduction strategy. Which, they are not the target objects but the community groups that actively empower other communities to expand the benefits achieved.

3. Cooperation with Other Institutions

   The involvement of other institutions in disaster risk reduction program by BPBD Malang Regency becomes a very significant influential factor. The institutions involved are from international to village level, include

international aid agencies, central government, local government, private, universities, and non-governmental organizations.

5.2 Suggestion

Based on the analysis from interviews and documentation, the suggestions that researcher can serve as an effort to improve disaster risk reduction strategy of BPBD Malang Regency are as follows:

1. There needs the funding source other than APBD, in order to not depend to only one funding source. It is to accelerate the achievement of high regional capacity level and expand the benefits of program. By holding Corporate Social Responsibility from private parties, funding sources are more varied and disaster risk reduction efforts can be collaborated with various parties.
2. The lack of personnel of BPBD Malang Regency become obstacles since 2014. Therefore BPBD Malang Regency should continue to fight for additional personnel from Local Government of Malang Regency to lighten the workload and the implementation of disaster risk reduction is more effective.
3. Risk assessment should be carried out annually to ensure that risk conditions are continually updated. Recent condition updates are useful for determining next target locations of program, and can be a concrete evaluation of whether the program can reduce the previous disaster risk index.
4. In determining the target location for any disaster risk reduction program, it should consider to the risk and capacity condition in each region and prioritize the areas with low capacity and high disaster potential.

5. BPBD Malang Regency in disaster socialization to students, it better to empower the teachers first. Then the teacher socialize the disaster management information to the students. This can be done at all the school in every districts. So the information of disaster can quickly spread by the teachers.
6. Increase the provision of disaster information by provide applied data through an effective information system (website). Identify and collect the results of regional disaster researches that have been done by establish a library of regional disaster research, so that there is a database of regional disaster management research and a library of research that can be widely accessible.
7. BPBD Malang Regency needs to utilize research to reduce disaster risk in a structured way by empowering universities, internal researchers and government employees in conducting research. Then local government of Malang Regency needs to integrate the research results into disaster management policies and plans. A regional disaster research forum should also be established as a forum for communication and synchronization among disaster researchers in the region.

BIBLIOGRAPHY

Act Number 24 of 2007 on Disaster Management.

Ahdi, Didi. 2014. "Perencanaan Penanggulangan Bencana Melalui Pendekatan Manajemen Risiko". *Dissertation of Faculty of Administrative Science, Universitas Brawijaya*.

Anonim. April 2nd, 2017. *Kabupaten Masuk 6 Besar Rawan Bencana.* Accessed through http://www.radarmalang.id/kabupaten-masuk-6-besar-rawan-bencana in October 16th, 2017.

Aziz, Nyimas Latifah Letty. 2016. *Hubungan Kerjasama Pemerintah dengan Pihak Swasta dalam Pembangunan Infrastruktur di Indonesia*. Accessed through http://www.politik.lipi.go.id/kolom/kolom-1/politik-lokal/1107-hubungan-kerjasama-pemerintah-dengan-pihak-swasta-dalam-pembangunan-infrastruktur-di-indonesia in May, 7th 2018.

Badan Perencanaan Pembangunan Nasional. 2017. *Guidebook of Regional Development Performance Evaluation 2017*. Jakarta: Bappenas.

Badan Nasional Penanggulangan Bencana. 2016. *Penurunan Indeks Risiko Bencana di Indonesia*. Downloaded through http://kawasan.bappenas.go.id/images/data/Kegiatan/Berita/14122016/Penurunan_IRBI_Indonesia.pdf in October 15th, 2017.

Bungin, Burhan. 2014. *Penelitian Kualitatif: Komunikasi Ekonomi, Kebijakan Publik dan Ilmu Sosial Lainnya.* Jakarta: Kencana Prenada Media Group.

Creswell. 2015. *Penelitian Kualitatif & Desain Riset*. Yogyakarta: Pustaka Pelajar.

Crabtree and Braun. 2014. "PhotoVoice: A Community-Based Participatory Approach in Developing Disaster Reduction Strategies". *Journal of Healthcare Association of Hawaii, Emergency Services*. Downloaded from www.proquest.com.

Dar, et al. 2014. "Integrating Health Into Disaster Risk Reduction Strategies: Key Considerations for Success". *American Journal of Public Health, October 2014, Vol 104, No. 10*. Downloaded from www.proquest.com.

Fadillah, Laxmi and Ira Safitri Darwin. 2016. "Strategi Pengurangan Risiko Banjir Melalui Disaster Risk Management di Kota Sungai Penuh". *Proceedings of Regional and City Planning, Islamic University of Bandung*. Downloaded from repository.unisba.ac.id.

Greenhalgh, Trisha, and Rod Taylor. 2013. "How to read a paper: Papers that go beyond numbers (qualitative research)". *Article of Idaho State University, vol.315, p.1*. Accessed through http://ed.isu.edu/sspe in September 16th, 2017.

Hadisubroto, Subino. 2007. *Pokok-Pokok Pengumpulan data, Analisis Data, Penafsiran Data dan Rekomendasi Data Penelitian Kualitatif*. IKIP Bandung: PPS.

Hoppe, et al. 2014. "Reflections On The Uptake of Climate Change Policies by Local Governments: Facing The Challenges of Mitigation and Adaptation". *SpringerOpen Journal 2014, 4:8*. Downloaded from www.proquest.com.

Indiyanto, Agus, and Arqom Kuswanjono. 2012. *Respons Mayarakat Lokal atas Bencana*. Yogyakarta: Mizan Pustaka.

International Bank for Reconstruction and Development. 2010. *Ancaman Alami, Bencana Tidak Alami: Ekonomi untuk Pencegahan yang Efektif*. Jakarta: Salemba Empat.

Kiswara, Brama Yoga. July 20th, 2017. *Sampai Bulan Juli Ini, 72 Bencana Alam Terjadi di Kabupaten Malang*. Accessed through http://beritajatim.com/peristiwa/303408/sampai_bulan_ini,_72_bencana_alam_terjadi_di_kabupaten_malang.html in October 16th, 2017.

Kusumasari, Bevaola. 2014. *Manajemen Bencana dan Kapabilitas Pemerintah Lokal*. Yogyakarta: Gava Media.

Local Regulation of Malang Regency Number 4 of 2011.

Ma'arif, Syamsul. 2012. *Pikiran dan Gagasan Penanggulangan Bencana di Indonesia*. Jakarta: BNPB.

McNabb, David E. 2002. *Research Methods in Public Administration and Nonprofit Management.* New York: M.E. Sharpe.

Moleong, Lexy J. 2014. *Metodologi Penelitian Kualitatif*. Bandung: Remaja Rosdakarya.

Nasyiruddin, et al. 2015. "Strategi Pemerintah Daerah dalam Penanggulangan Bencana Banjir di Kabupaten Bantaeng". *Journal of Governmental Science, Muhammadiyah University of Makassar Vol. V No. 2, October 2015*. Downloaded from journal.unismuh.ac.id.

National Research Council, Department of Energy Project Management. 2005. *The Owner's Role in Project Risk Management.* Washington DC. Downloaded through https://www.nap.edu/read/11183/chapter/7#42 in October 23rd, 2017.

National Research Council, Committee on Disaster Research. 2006. *Facing Hazards and Disasters: Understanding Human Dimensions*. Washington DC. Downloaded through https://www.nap.edu/read/11671/chapter/8#222 in October 23rd, 2017.

Ngusmanto. 2015. *Pemikiran dan Praktik Administrasi Pembangunan*. Jakarta: Mitra Wacana Media.

Nurjannah, et al. 2012. *Manajemen Bencana*. Bandung: Alfabeta.

Performance Report of Badan Penanggulangan Bencana Daerah Kabupaten Malang 2013, 2014, 2015, 2016, 2017.

Plan of Disaster Management of Badan Penanggulangan Bencana Daerah Kabupaten Malang 2015-2019.

Prastyan, Hafid Rozzaaq. 2017. "Strategi Pemerintah Daerah dalam Mengembangkan Investasi di Kabupaten Gresik". *Undergraduate Thesis of Universitas Brawijaya*.

Purnomo, Hadi, and Ronny Sugiantoro. 2010. *Manajemen* Strategi*: Sebuah Konsep Pengantar*. Jakarta: LP FE-UI.

Putra, Fadillah. 2009. *Sound Governance Berakhirnya Good Governance*. Downloaded through http://blog.ub.ac.id/irfan11/files/2013/02/Sound-Governance-Berakhirnya-Good-Governance-oleh-Fadillah-Putra.pdf in May, 7th 2018.

Rijal, Shulhan Syamsur. March, 5th, 2017. *Angka dan Data Bencana Alam di Indonesia 2016-2017*. Accessed through https://archive.act.id/id/whats-happening/view/3671/angka-dan-data-bencana-alam-di-indonesia-2016-2017 in September 16th, 2017.

Satrio, Fery Agusta. February 29th, 2016. *BPBD Kabupaten Malang Raih Penghargaan Terbaik Nasional*. Accessed through https://www.timesindonesia.co.id/read/119572/20160229/174213/bpbd-kabupaten-malang-raih-penghargaan-terbaik-nasional/ in October 17th, 2017.

Sedarmayanti. 2004. *Good Governance (Kepemerintahan yang Baik) bagian Kedua Membangun Sistem Manajemen Kinerja Guna Meningkatkan Produktivitas Menuju Good Governance (Kepemerintahan yang Baik)*. Bandung: CV Mandar Maju.

Siagian, Sondang P. 2004. *Filsafat Administrasi.* Jakarta: PT. Bumi Aksara.

Siagian, Sondang P. 2008. *Administrasi Pembangunan: Konsep, Dimensi dan Strategi.* Jakarta: PT. Bumi Aksara.

Strategic Plan of Badan Penanggulangan Bencana Daerah Kabupaten Malang 2016- 2021.

Sudibyakto, and Priatmodjo. 2016. "Manajemen Risiko Bencana Pada Kawasan Cagar Budaya Gunung Padang, Ciamis, Jawa Barat". *Journal of Disaster Research Indonesia Vol 2 No 1 May 2016*. Downloaded from www.iabi.indonesia.org.

Twigg, John. 2015. *Disaster Risk Reduction*. UK London: Humanitarian Policy Group.

Udaya, Jusuf. 2013. *Manajemen Stratejik*. Jakarta: Graha Ilmu.

United Nations International Strategy of Disaster Reduction. 2002. *International Strategy for Disaster Reduction*. Opened through www.unisdr.org.

_____. 2012. *UNISDR Annual Report 2012*. Downloaded through http://www.unisdr.org/files/33363_unisdrannualreport2012.pdf in November 12th, 2017.

_____. 2005. Hyogo Framework Actions 2005-2015. Downloaded through https://www.unisdr.org/2005/wcdr/...doc/.../Hyogo-framework-for-action-english.pdf in May, 7th 2018.

_____. 2005. Sendai Framework Action for Disaster Risk Reduction 2015-2030. Downloaded through https://www.unisdr.org/we/inform/publications /43291 in May, 7th 2018.

www.bnpb.go.id

www.bpbd.malangkab.go.id

DOKUMEN RENCANA PENANGGULANGAN BENCANA (RPB)

KABUPATEN MALANG 2015-2019

Australian Aid

AUSTRALIA-INDONESIA FACILITY FOR DISASTER REDUCTION

BNPB

LPBI NU

BADAN PENANGGULANGAN BENCANA DAERAH

BPBD

KABUPATEN MALANG

BAB III

KAJIAN RISIKO BENCANA

A. METODOLOGI

Tingkatan risiko bencana di suatu wilayah bergantung kepada kontribusi dan interaksi dari 3 komponen yaitu ancaman, kerentanan dan kapasitas wilayah tersebut. Bencana akan menimbulkan dampak apabila tingkat ancaman terlalu tinggi, kerentanan terlalu besar sementara daerah serta masyarakat tidak memiliki kapasitas yang cukup untuk mengatasinya. Interaksi di antara ketiga komponen tersebut, ditambah dengan kontribusi dari faktor-faktor luar kemudian menjadi dasar untuk melakukan suatu kajian risiko bencana di suatu daerah. Hasil kajian ini kemudian akan menjadi dasar bagi penyusunan strategi dan program terkait pengurangan risiko bencana di daerah tersebut.

Komponen pengkajian risiko bencana digunakan untuk memperoleh tingkat risiko bencana suatu kawasan dengan menghitung potensi penduduk terpapar, kerugian harta benda, dan kerusakan lingkungan serta kapasitas daerah dalam menanggulangi bencana. Selain tingkat risiko, kajian diharapkan mampu menghasilkan peta risiko untuk setiap bencana yang ada pada suatu kawasan. Kajian dan peta risiko bencana ini harus mampu menjadi dasar yang memadai bagi daerah untuk menyusun kebijakan penanggulangan bencana. Ditingkat masyarakat hasil pengkajian diharapkan dapat dijadikan dasar yang kuat dalam perencanaan upaya pengurangan risiko bencana.

1. Prasyarat Umum

a) Memenuhi aturan tingkat kedetilan analisis (kedalaman analisis di tingkat nasional minimal hingga kabupaten/kota, kedalaman analisis di tingkat provinsi minimal hingga kecamatan, kedalaman analisis di tingkat kabupaten/kota minimal hingga tingkat kelurahan/desa/kampung/nagari).

b) Skala peta minimal adalah 1:250.000 untuk provinsi; peta dengan skala 1:50.000 untuk kabupaten/kota di Pulau Sumatera, Kalimantan dan Sulawesi;

peta dengan skala 1:25.000 untuk kabupaten/kota di Pulau Jawa dan Nusa Tenggara.

c) Mampu menghitung jumlah jiwa terpapar bencana (dalam jiwa).

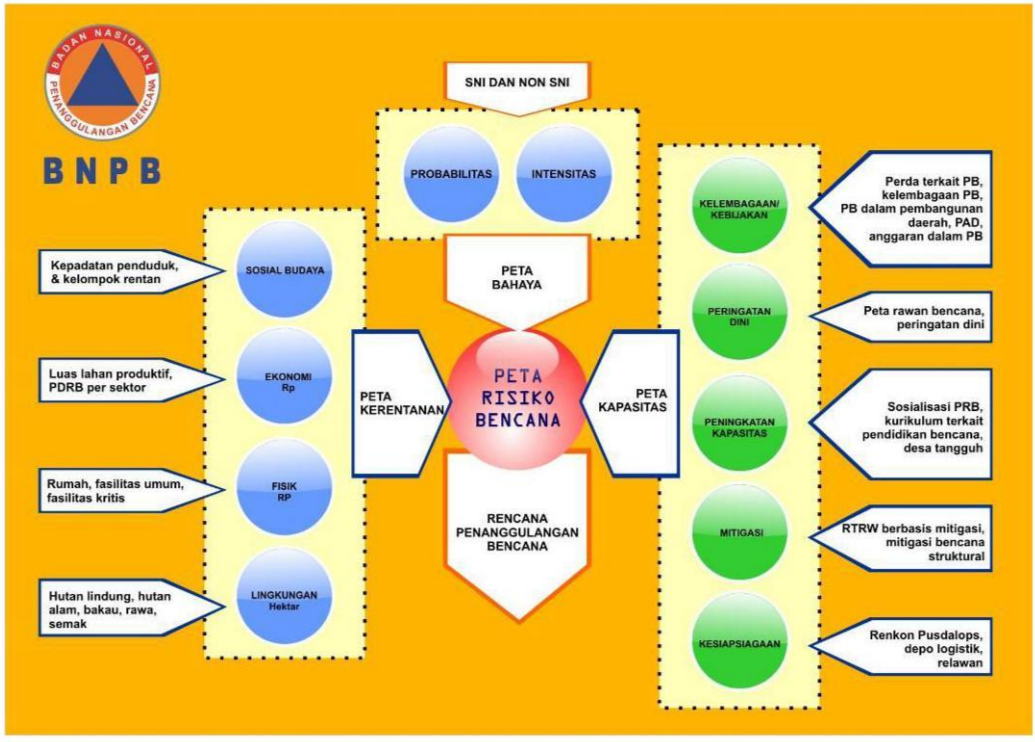
d) Mampu menghitung nilai kerugian harta benda dan kerusakan lingkungan (dalam rupiah).

e) Menggunakan 3 kelas interval tingkat risiko, yaitu tingkat risiko tinggi, sedang, dan rendah.

f) Menggunakan GIS dengan dan *Analisa Grid* (250 ha) dalam pemetaan risiko bencana.

2. Metode Umum

Pengkajian risiko bencana dilaksanakan dengan menggunakan metode yang dikeluarkan oleh Tim Penyusun RPB Kabupaten Malang Tahun 2015 dan BNPB seperti yang terlihat pada **Gambar 6**.



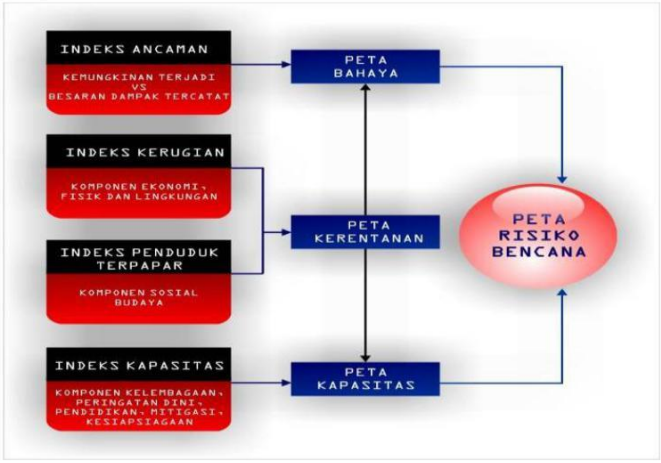
Gambar 6. Metode Pengkajian Risiko Bencana

Pengkajian risiko bencana untuk menghasilkan kebijakan penanggulangan bencana disusun berdasarkan komponen ancaman, kerentanan, dan kapasitas. Komponen Ancaman disusun berdasarkan parameter intensitas dan probabilitas kejadian. Komponen Kerentanan disusun berdasarkan parameter sosial budaya, ekonomi, fisik, dan lingkungan. Komponen Kapasitas disusun berdasarkan parameter kapasitas regulasi, kelembagaan, sistem peringatan, pendidikan pelatihan keterampilan, mitigasi, dan sistem kesiapsiagaan.

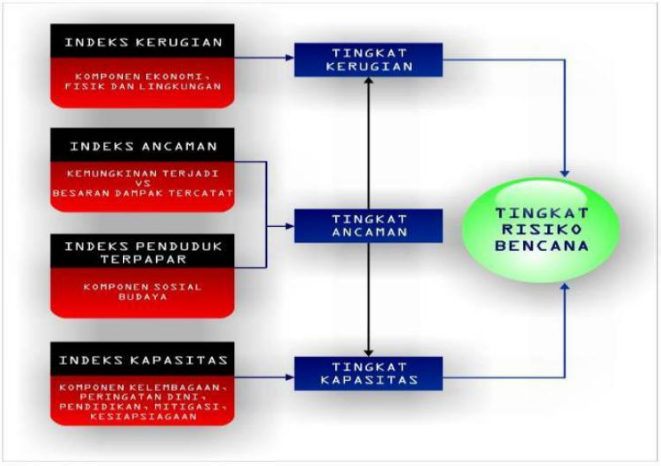
Hasil pengkajian risiko bencana terdiri dari 2 bagian yaitu:

a) Peta Risiko Bencana.

b) Dokumen Kajian Risiko Bencana.



Gambar 7. Pemetaan Risiko Bencana



Gambar 8. Metode Penyusunan Dokumen Kajian Risiko Bencana

Mekanisme penyusunan Peta Risiko Bencana saling terkait dengan mekanisme penyusunan Dokumen Kajian Risiko Bencana. Proses penyusunan kedua hasil pengkajian risiko bencana yang akan dilakukan dapat dilihat dan dibedakan melalui gambar berikut:

Pada **Gambar 7** terlihat bahwa Peta Risiko Bencana merupakan *overlay* (penggabungan) dari Peta Ancaman, Peta Kerentanan, dan Peta Kapasitas. Peta tersebut diperoleh dari berbagai indeks yang

dihitung dari data dan metode perhitungan tersendiri.

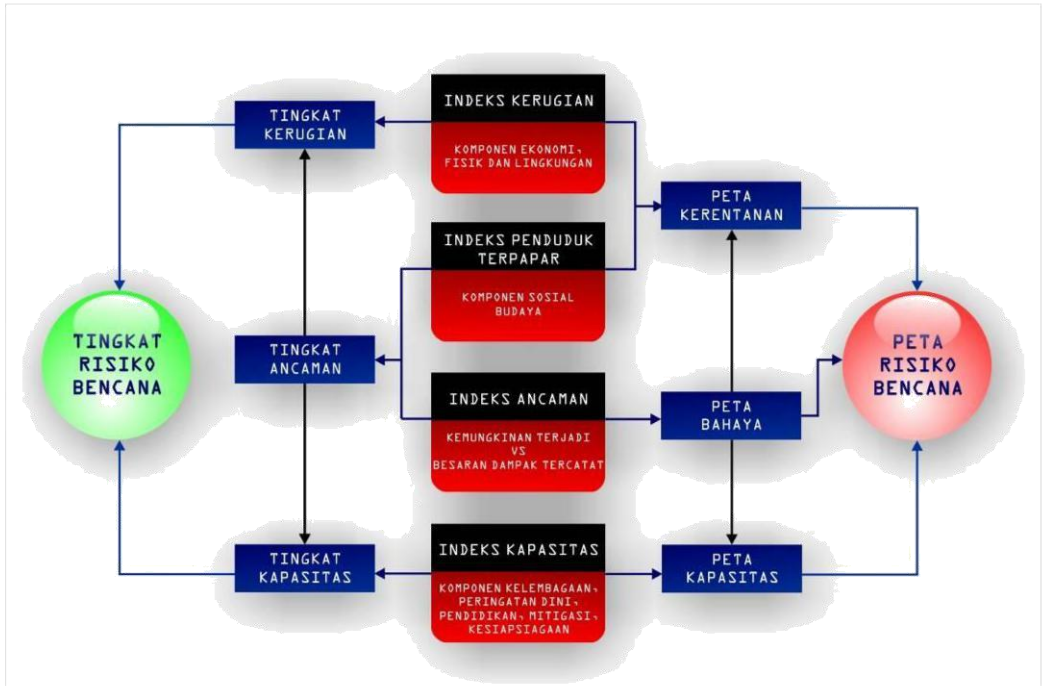
Peta risiko bencana dibuat untuk setiap jenis ancaman bencana yang ada pada suatu kawasan. Metode perhitungan dan data yang dibutuhkan untuk menghitung berbagai indeks akan berbeda di setiap jenis ancaman.

Gambar 8 memperlihatkan bahwa kajian risiko bencana diperoleh dari indeks dan data yang sama dengan penyusunan Peta Risiko Bencana. Perbedaan yang terjadi hanya pada urutan penggunaan masing-masing indeks. Urutan ini berubah disebabkan jiwa manusia tidak dapat dinilai dengan rupiah. Oleh karena itu, Tingkat Ancaman yang telah memperhitungkan indeks ancaman di dalamnya menjadi dasar bagi perhitungan Tingkat Kerugian dan Tingkat Kapasitas. Gabungan Tingkat Kerugian dan Tingkat Kapasitas merupakan Tingkat Risiko Bencana.

3. Korelasi Penyusunan Peta dan Dokumen Kajian

Seperti yang terlihat pada **Gambar 7** dan **Gambar 8**, korelasi antara metode penyusunan Peta Risiko Bencana dan Dokumen Kajian Risiko Bencana terletak pada seluruh indeks penyusunannya.

Indeks-indeks tersebut bila diperhatikan kembali disusun berdasarkan komponen-komponen yang telah dipaparkan pada **Gambar 6**. Korelasi penyusunan Peta dan Dokumen Kajian Risiko Bencana merupakan Metode Umum Pengkajian Risiko Bencana Indonesia, seperti pada **Gambar 9**.



Gambar 9. Metode Umum Pengkajian Risiko Bencana Indonesia

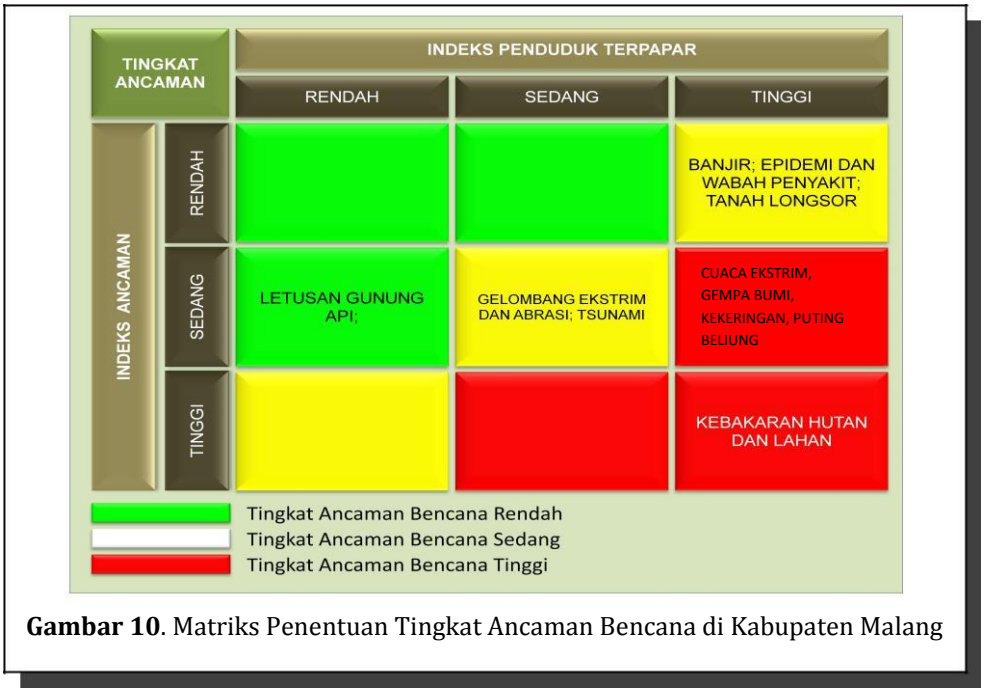
Dari gambar di atas, dapat disimpulkan bahwa Peta Risiko Bencana merupakan salah satu komponen pencapaian Dokumen Kajian Risiko Bencana yang akan dihasilkan sebagai landasan untuk pembuatan Rencana Penanggulangan Bencana Daerah (RPBD). Selain itu, Dokumen Kajian Risiko Bencana juga harus menyajikan kebijakan minimum penanggulangan bencana daerah yang ditujukan untuk mengurangi jumlah jiwa terpapar, kerugian harta benda, dan kerusakan lingkungan.

B. TINGKAT ANCAMAN

Dalam menentukan tingkat ancaman bencana, dapat dilakukan dengan menggunakan matriks tingkat ancaman yang dipadukan dengan indeks ancaman pada lajur dengan indeks penduduk terpapar pada kolom. Tingkat ancaman merupakan titik pertemuan antara indeks ancaman dengan indeks penduduk terpapar. Penentuan skala indeks ancaman dapat dibagi menjadi 3 kategori yaitu: indeks rendah (0,0 – 0,3), indeks sedang (> 0,3 – 0,6) dan indeks tinggi (> 0,6 – 1,0). Sedangkan untuk skala indeks penduduk terpapar juga dapat dibagi menjadi kategori rendah, sedang, dan tinggi, dengan ketentuan nilai indeksnya adalah:

- Indeks Rendah : Apabila kepadatan jumlah penduduk terpapar kurang dari 500 jiwa/km$_2$ dan jumlah penduduk kelompok rentan kurang dari 20%.
- Indeks Sedang : Apabila kepadatan jumlah penduduk terpapar 500–1000 jiwa/km$_2$ dan jumlah penduduk kelompok rentan 20%–40%.
- Indeks Tinggi : Apabila kepadatan jumlah penduduk terpapar lebih dari 1000 jiwa/km$_2$ dan jumlah penduduk kelompok rentan lebih dari 40%.

Untuk melihat tingkat ancaman di Kabupaten Malang berdasarkan jenis bencana yang berpotensi pada skala ancaman masing-masing jenis bencana dan skala penduduk terpapar, dapat dilihat pada **Gambar 10**.



Gambar 10. Matriks Penentuan Tingkat Ancaman Bencana di Kabupaten Malang

Dari gambar di atas dapat jelaskan bahwa tingkat ancaman setiap bencana yang berpotensi di Kabupaten Malang adalah:

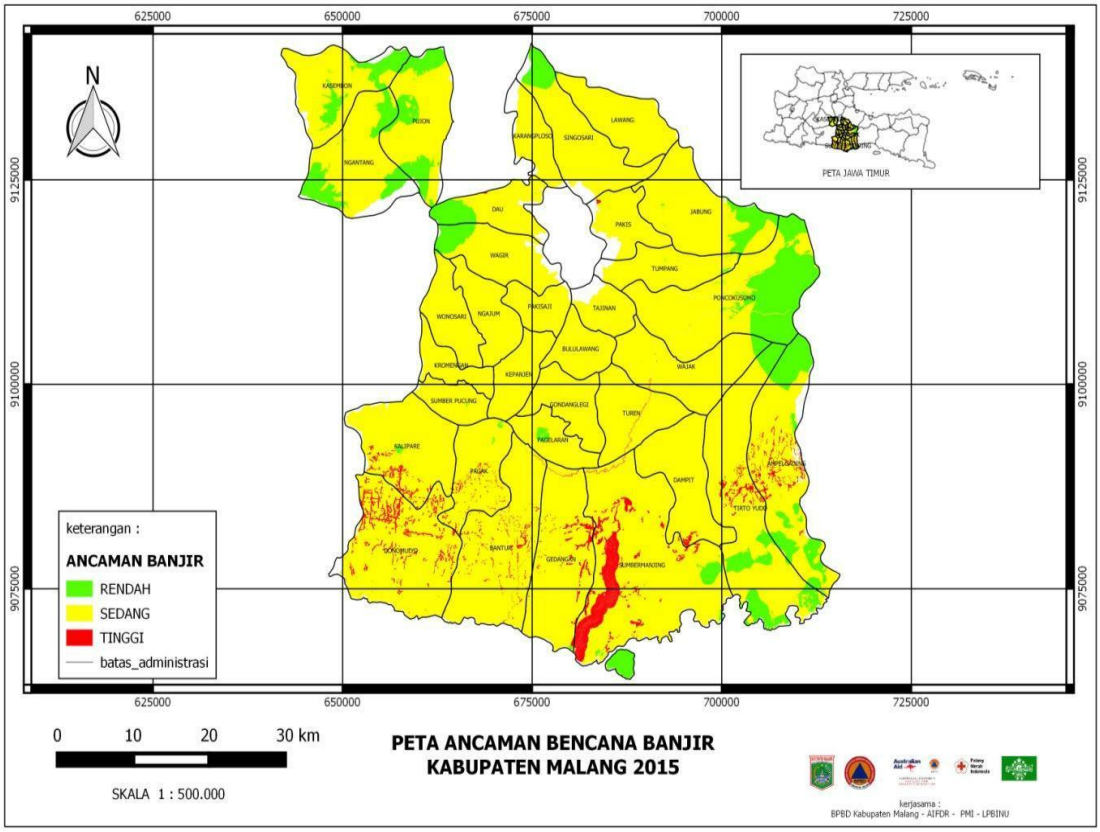
1. Tingkat ancaman bencana letusan gunung api adalah **RENDAH**. Hal ini disebabkan karena indeks ancamannya adalah sedang dan indeks penduduk terpaparnya rendah.
2. Tingkat ancaman bencana gelombang ekstrim dan abrasi dan tsunami adalah **SEDANG**. Hal ini disebabkan karena indeks ancamannya *sedang* dan indeks penduduk terpaparnya adalah juga *Sedang*. Sedangkan bencana banjir, epidemic

dan wabah penyakit serta tanah longsor memiliki indeks ancaman *rendah* dan indeks penduduk terpapar *tinggi*.

3. Tingkat ancaman bencana cuaca ekstrim, puting beliung, gempa bumi dan kekeringan adalah **TINGGI**. Hal ini disebabkan karena indeks ancamannya adalah *sedang* dan indeks penduduk terpaparnya *tinggi*. Sedangkan bencana kebakaran hutan dan lahan memiliki indeks ancaman *tinggi* dan indek penduduk terpapar juga *tinggi*.

Penentuan indeks ancaman bencana di Kabupaten Malang dapat disusun berdasarkan data dan catatan sejarah kebencanaan yang pernah terjadi di Kabupaten Malang. Indeks ancaman bencana tersebut disusun berdasarkan komponen kemungkinan terjadinya suatu ancaman dan komponen besarnya dampak yang pernah tercatat untuk bencana yang terjadi tersebut. Indeks ancaman dapat disesuaikan dengan standar parameter yang telah ditentukan oleh BNPB dengan merujuk kepada peta ancaman setiap bencana di Kabupaten Malang. Berikut dijelaskan rata-rata indeks ancaman setiap bencana yang pernah terjadi di Kabupaten Malang, serta peta-peta ancaman yang dibuat oleh Tim Peta Kabuapten Malang 2015

1. Banjir



Gambar 10.1 Peta Ancaman Banjir kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

Penghitungan indeks ancaman bencana banjir mengacu kepada beberapa parameter berdasarkan Pedoman Nasional Pengkajian Risiko Bencana. Parameter yang dilihat untuk menghitung indeks ancaman bencana banjir adalah *geomorfologi*, persentase luas DAS, *landuse* (tutupan *vegetasi*), jenis tanah, intensitas hujan tahunan sehingga menghasilkan skor bahaya. Sementara itu, perhitungan kelas indeks ancaman dan indeks penduduk terpapar menghasilkan tingkat ancaman yang terdiri dari tiga tingkatan, yaitu kelas tingkat ancaman rendah, sedang dan tinggi.

Berdasarkan penyebabnya, banjir di Kabupaten Malang dapat diklasifikasikan menjadi 3 jenis, yaitu:

1. banjir bandang (*flash flood*), disebabkan oleh tipe hujan dengan intensitas yang tinggi dan terjadi pada tempat-tempat dengan topografi yang curam di bagian hulu sungai;

2. banjir genangan, disebabkan adanya genangan yang berasal dari air hujan loka; dan.
3. banjir yang disebabkan oleh naiknya permukaan air laut (Banjir Rob).

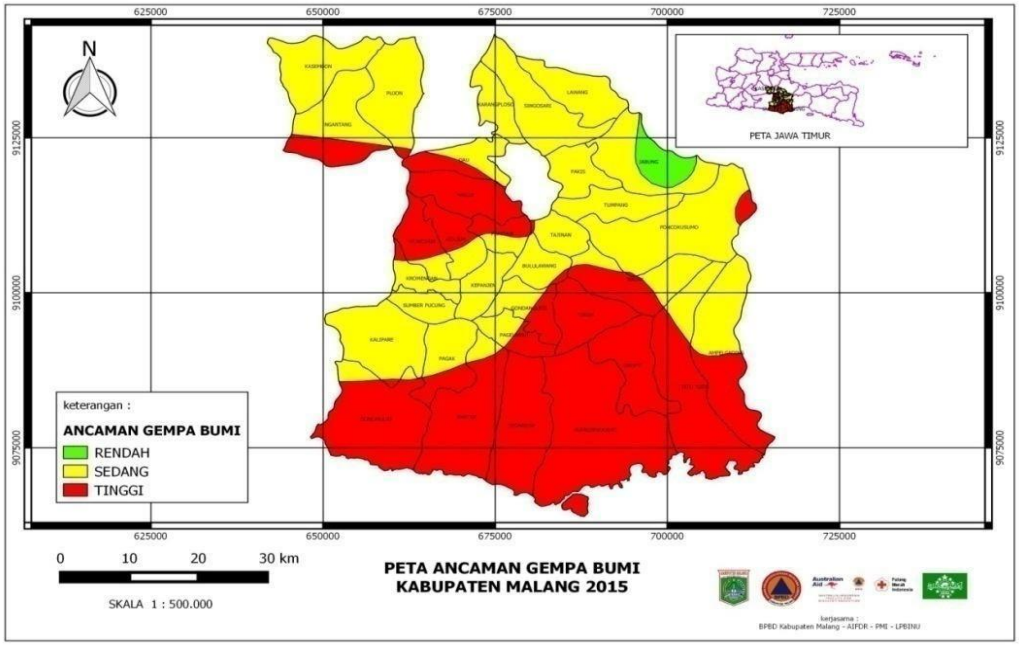
Analisis kajian risiko Kabupaten Malang didapatkan tingkat ancaman bencana banjir di Kabupaten Malang adalah **SEDANG.** Tingkat ancaman sedang diperoleh dari indeks ancaman bencana *rendah* dan indeks penduduk terpapar *tinggi* dengan jumlah penduduk terpapar **2.241.875 jiwa** di wilayah berpotensi bencana banjir.

2. Gelombang Ekstrem dan Abrasi

Penghitungan indeks ancaman bencana gelombang ekstrim dan abrasi mengacu kepada beberapa parameter berdasarkan Pedoman Nasional Pengkajian Risiko Bencana. Parameter yang dilihat untuk menghitung indeks ancaman bencana gelombang ekstrem dan abrasi adalah tinggi gelombang, arus, tutupan vegetasi, dan bentuk garis pantai. Sementara itu, perhitungan kelas indeks ancaman dan indeks jiwa terpapar menghasilkan tingkat ancaman yang terdiri dari tiga tingkatan, yaitu kelas tingkat ancaman rendah, sedang, dan tinggi.

Berdasarkan hasil analisis kajian risiko Kabupaten Malang didapatkan bahwa tingkat ancaman bencana gelombang ekstrem dan abrasi di Kabupaten Malang adalah **SEDANG.** Tingkat ancaman sedang diperoleh dari indeks ancaman bencana *sedang* dan indeks penduduk terpapar *sedang* dengan jumlah penduduk terpapar **11.031 jiwa** di wilayah berpotensi bencana gelombang ekstrim dan abrasi.

3. Gempa Bumi



Gambar 10.2 Peta Ancaman Gempa Bumi kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

Penghitungan indeks ancaman bencana gempa bumi mengacu kepada beberapa parameter berdasarkan Pedoman Nasional Pengkajian Risiko Bencana. Parameter yang dilihat untuk menghitung indeks ancaman bencana gempa bumi adalah peta SNI gempa bumi, jarak dari sesar aktif, peta MMI 10 tahun, kerapatan patahan, gemorfologi dan geologi. Sementara itu, perhitungan kelas indeks ancaman dan indeks jiwa terpapar menghasilkan tingkat ancaman yang terdiri dari tiga tingkatan, yaitu kelas tingkat ancaman rendah, sedang, dan tinggi.

Berdasarkan hasil analisis kajian risiko Kabupaten Malang didapatkan bahwa tingkat ancaman bencana gempa bumi di Kabupaten Malang adalah **TINGGI.** Tingkat ancaman tinggi diperoleh dari indeks ancaman bencana *sedang* dan indeks penduduk terpapar *tinggi* dengan jumlah penduduk terpapar **2.248.936 jiwa** di wilayah berpotensi bencana gempa bumi.

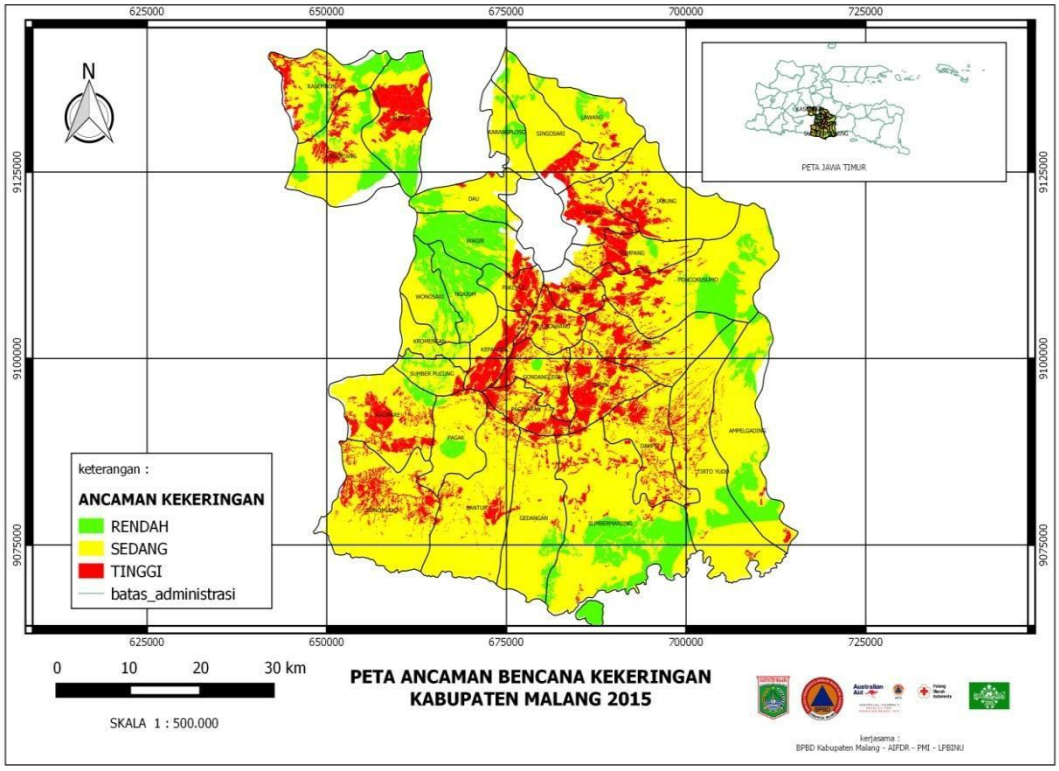
4. Kebakaran Hutan dan Lahan

Penghitungan indeks ancaman bencana kebakaran hutan dan lahan mengacu kepada beberapa parameter berdasarkan Pedoman Nasional Pengkajian Risiko Bencana. Parameter yang dilihat untuk menghitung indeks ancaman bencana kebakaran hutan dan lahan adalah jenis hutan, curah hujan tahunan, dan jenis

tanah. Sementara itu, perhitungan kelas indeks ancaman dan indeks jiwa terpapar menghasilkan tingkat ancaman yang terdiri dari tiga tingkatan, yaitu kelas tingkat ancaman rendah, sedang, dan tinggi.

Berdasarkan hasil analisis kajian risiko Kabupaten Malang didapatkan bahwa tingkat ancaman bencana kebakaran hutan dan lahan di Kabupaten Malang adalah **TINGGI.** Tingkat ancaman tinggi diperoleh dari indeks ancaman bencana *tinggi* dan indeks penduduk terpapar *tinggi* dengan jumlah penduduk terpapar **2.444.685 jiwa** di wilayah berpotensi bencana kebakaran hutan dan lahan.

5. Kekeringan



Gambar 10.3 Peta Ancaman Kekeringan Kabupaten Malang
(*Sumber: Hasil Pemetaan , 2015)*

Penghitungan indeks ancaman bencana kekeringan mengacu kepada beberapa parameter berdasarkan Pedoman Nasional Pengkajian Risiko Bencana. Parameter yang dilihat untuk menghitung indeks ancaman bencana kekeringan adalah peta SNI kekeringan, curah hujan tahunan, dan tutupan vegetasi. Sementara itu, perhitungan kelas indeks ancaman dan indeks jiwa terpapar menghasilkan tingkat

ancaman yang terdiri dari tiga tingkatan, yaitu kelas tingkat ancaman rendah, sedang, dan tinggi.

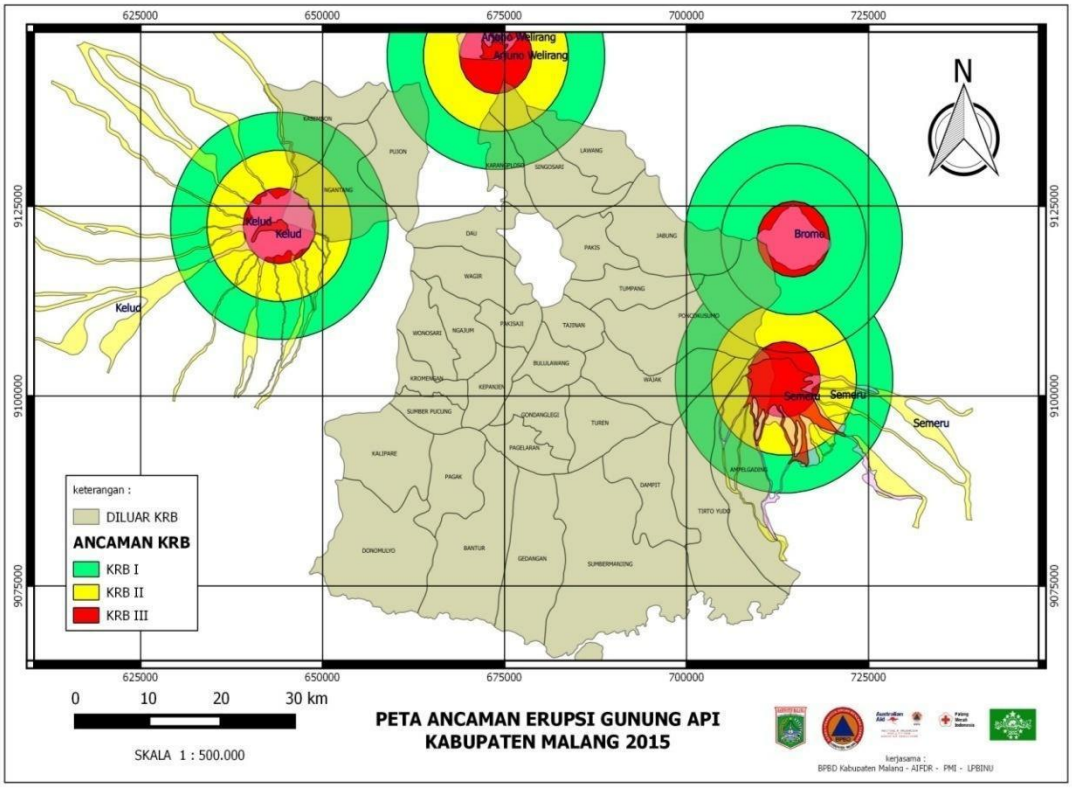
Berdasarkan hasil analisis kajian risiko Kabupaten Malang didapatkan bahwa tingkat ancaman bencana kekeringan di Kabupaten Malang adalah **TINGGI.** Tingkat ancaman tinggi diperoleh dari indeks ancaman bencana *sedang* dan indeks penduduk terpapar *tinggi* dengan jumlah penduduk terpapar **2.389.266 jiwa** di wilayah berpotensi bencana kekeringan.

6. Epidemi dan Wabah Penyakit

Penghitungan indeks ancaman bencana epidemi dan wabah penyakit mengacu kepada beberapa parameter berdasarkan Pedoman Nasional Pengkajian Risiko Bencana. Parameter yang dilihat untuk menghitung indeks ancaman bencana epidemi dan wabah penyakit adalah kepadatan penderita malaria, kepadatan penderita demam berdarah, kepadatan penderita HIV AIDS, dan kepadatan penduduk. Sementara itu, perhitungan kelas indeks ancaman dan indeks jiwa terpapar menghasilkan tingkat ancaman yang terdiri dari tiga tingkatan, yaitu kelas tingkat ancaman rendah, sedang, dan tinggi.

Berdasarkan hasil analisis kajian risiko Kabupaten Malang didapatkan bahwa tingkat ancaman bencana epidemi dan wabah penyakit di Kabupaten Malang adalah **SEDANG.** Tingkat ancaman sedang diperoleh dari indeks ancaman bencana *rendah* dan indeks penduduk terpapar *tinggi* dengan jumlah penduduk terpapar **2.445.415 jiwa** di wilayah berpotensi bencana epidemi dan wabah penyakit.

7. Erupsi Gunung Api



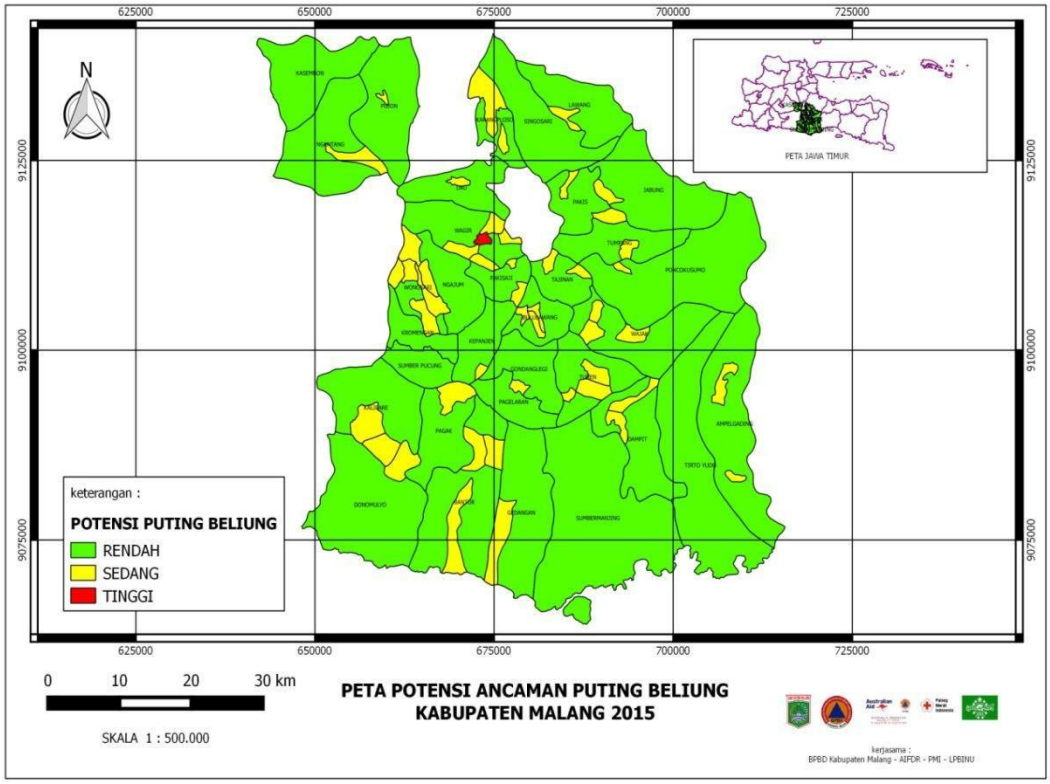
Gambar 10.4 Peta Ancaman Erupsi Gunung Api Kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

Penghitungan indeks ancaman bencana letusan gunung api mengacu kepada beberapa parameter berdasarkan Pedoman Nasional Pengkajian Risiko Bencana. Parameter yang dilihat untuk menghitung indeks ancaman bencana letusan gunung api adalah kawasan KRB. Sementara itu, perhitungan kelas indeks ancaman dan indeks jiwa terpapar menghasilkan tingkat ancaman yang terdiri dari tiga tingkatan, yaitu kelas tingkat ancaman rendah, sedang, dan tinggi.

Berdasarkan hasil analisis kajian risiko Kabupaten Malang didapatkan bahwa tingkat ancaman bencana letusan gunung api di Kabupaten Malang adalah **RENDAH.** Tingkat ancaman rendah diperoleh dari indeks ancaman bencana *sedang* dan indeks penduduk terpapar *rendah* dengan jumlah penduduk terpapar **9.163 jiwa** di wilayah berpotensi bencana letusan gunung api.

8. Cuaca Ekstrim dan Puting Beliung



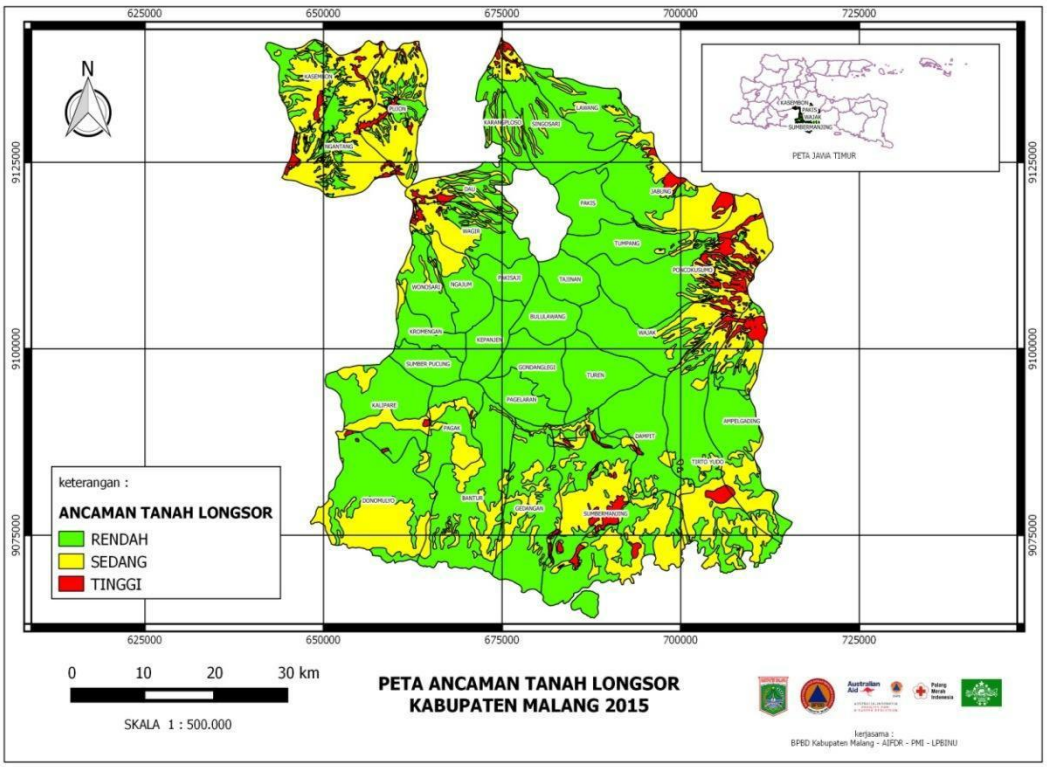
Gambar 10.5 Peta Ancaman Puting Beliung Kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

Penghitungan indeks ancaman bencana cuaca ekstrim dan puting beliung mengacu kepada beberapa parameter dan hasil digitasi kejadian berdasarkan Pedoman Nasional Pengkajian Risiko Bencana. Parameter yang dilihat untuk menghitung indeks ancaman bencana cuaca ekstrim adalah keterbukaan lahan, kemiringan lereng dan curah hujan tahunan. Sementara itu, perhitungan kelas indeks ancaman dan indeks jiwa terpapar menghasilkan tingkat ancaman yang terdiri dari tiga tingkatan, yaitu kelas tingkat ancaman rendah, sedang, dan tinggi.

Berdasarkan hasil analisis kajian risiko Kabupaten Malang didapatkan bahwa tingkat ancaman bencana cuaca ekstrim dan puting beliung di Kabupaten Malang adalah **TINGGI.** Tingkat ancaman tinggi diperoleh dari indeks ancaman bencana *sedang* dan indeks penduduk terpapar *tinggi* dengan jumlah penduduk terpapar **2.245.867 jiwa** di wilayah berpotensi bencana cuaca ekstrim.

9. Tanah Longsor



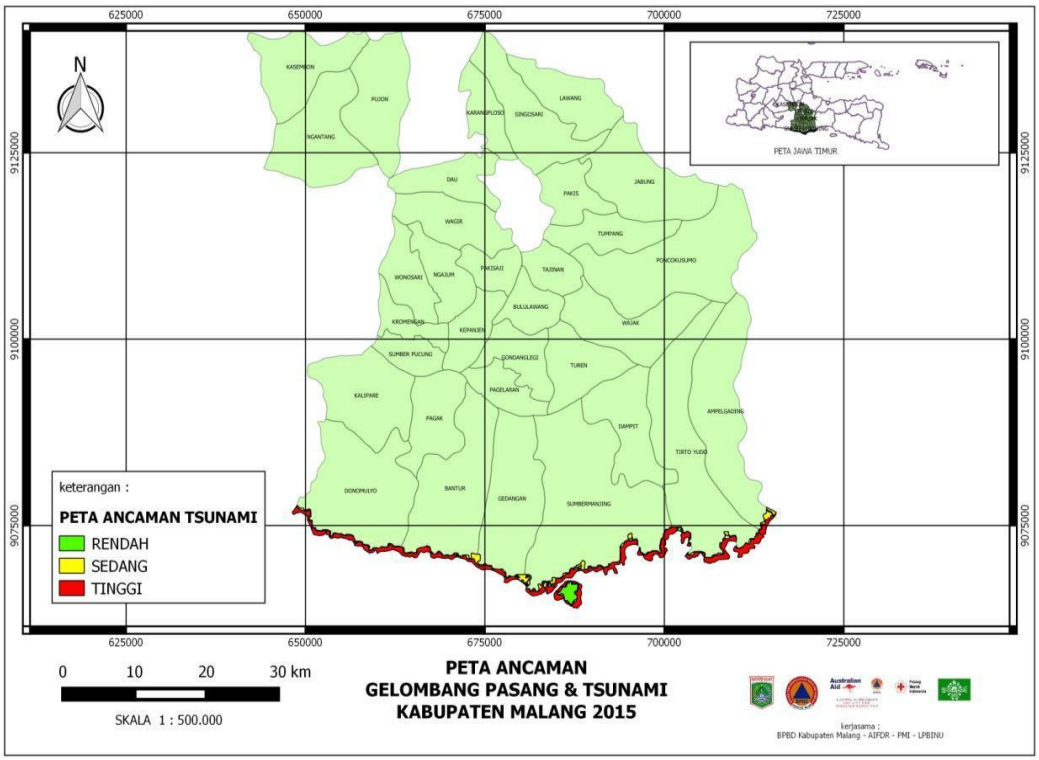
Gambar 10.6 Peta Ancaman Tanah Longsor Kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

Penghitungan indeks ancaman bencana tanah longsor mengacu kepada beberapa parameter berdasarkan Pedoman Nasional Pengkajian Risiko Bencana. Parameter yang dilihat untuk menghitung indeks ancaman bencana tanah longsor adalah persen kemiringan lereng, gemorfologi, tutupan vegetasi dan jarak sesar/patahan. Sementara itu, perhitungan kelas indeks ancaman dan indeks jiwa terpapar menghasilkan tingkat ancaman yang terdiri dari tiga tingkatan, yaitu kelas tingkat ancaman rendah, sedang, dan tinggi.

Berdasarkan hasil analisis kajian risiko Kabupaten Malang didapatkan bahwa tingkat ancaman bencana tanah longsor di Kabupaten Malang adalah **SEDANG.** Tingkat ancaman sedang diperoleh dari indeks ancaman bencana *rendah* dan indeks penduduk terpapar *tinggi* dengan jumlah penduduk terpapar **463.928 jiwa** di wilayah berpotensi bencana tanah longsor.

10. Tsunami



Gambar 10.7 Peta Ancaman Tsunami Kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

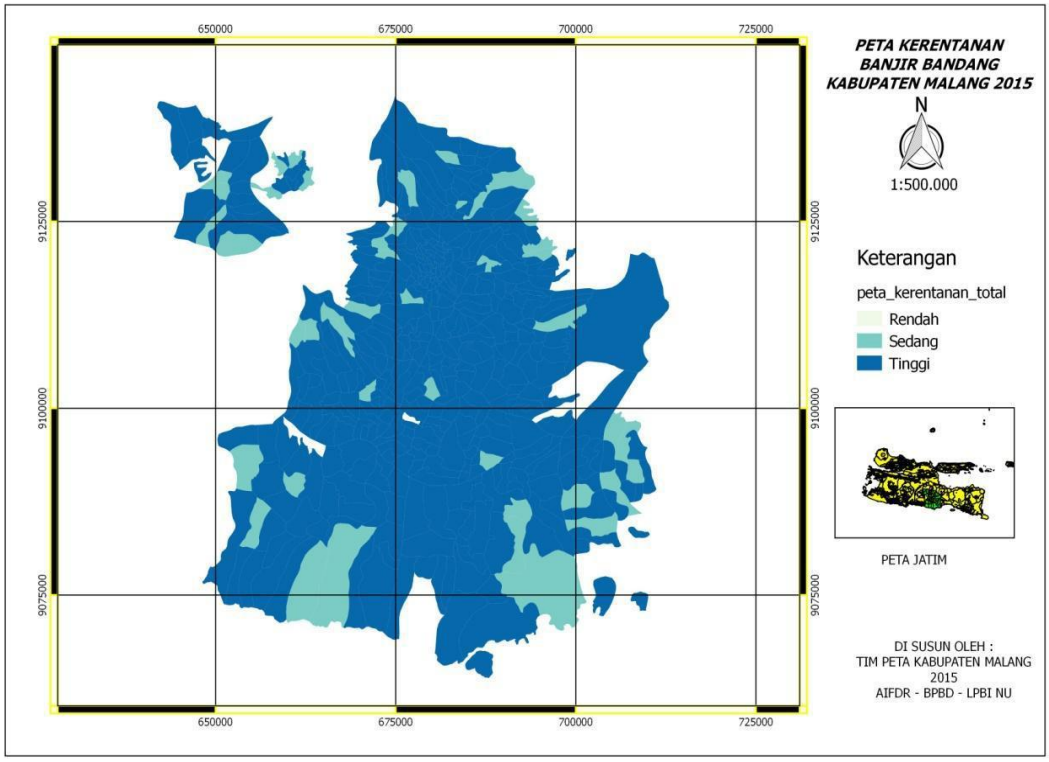
Penghitungan indeks ancaman bencana tsunami mengacu kepada beberapa parameter berdasarkan Pedoman Nasional Pengkajian Risiko Bencana. Parameter yang dilihat untuk menghitung indeks ancaman bencana tsunami adalah tabel max inundasi kecamatan (m). Sementara itu, perhitungan kelas indeks ancaman dan indeks jiwa terpapar menghasilkan tingkat ancaman yang terdiri dari tiga tingkatan, yaitu kelas tingkat ancaman rendah, sedang, dan tinggi.

Berdasarkan hasil analisis kajian risiko Kabupaten Malang didapatkan bahwa tingkat ancaman bencana tsunami di Kabupaten Malang adalah **SEDANG.** Tingkat ancaman sedang diperoleh dari indeks ancaman bencana *sedang* dan indeks penduduk terpapar *sedang* dengan jumlah penduduk terpapar **32.146 jiwa** di wilayah berpotensi bencana tsunami.

C. TINGKAT KERENTANAN

1. Banjir

Kerentanan untuk ancaman banjir di Kabupaten Malang termasuk ke dalam tingkat tinggi dan sedang; seperti terlihat pada gambar **10.8** Namun daerah dengan tingkat kerentanan sedang jumlahnya jauh lebih kecil dibandingkan dengan daerah dengan tingkat kerentanan tinggi.

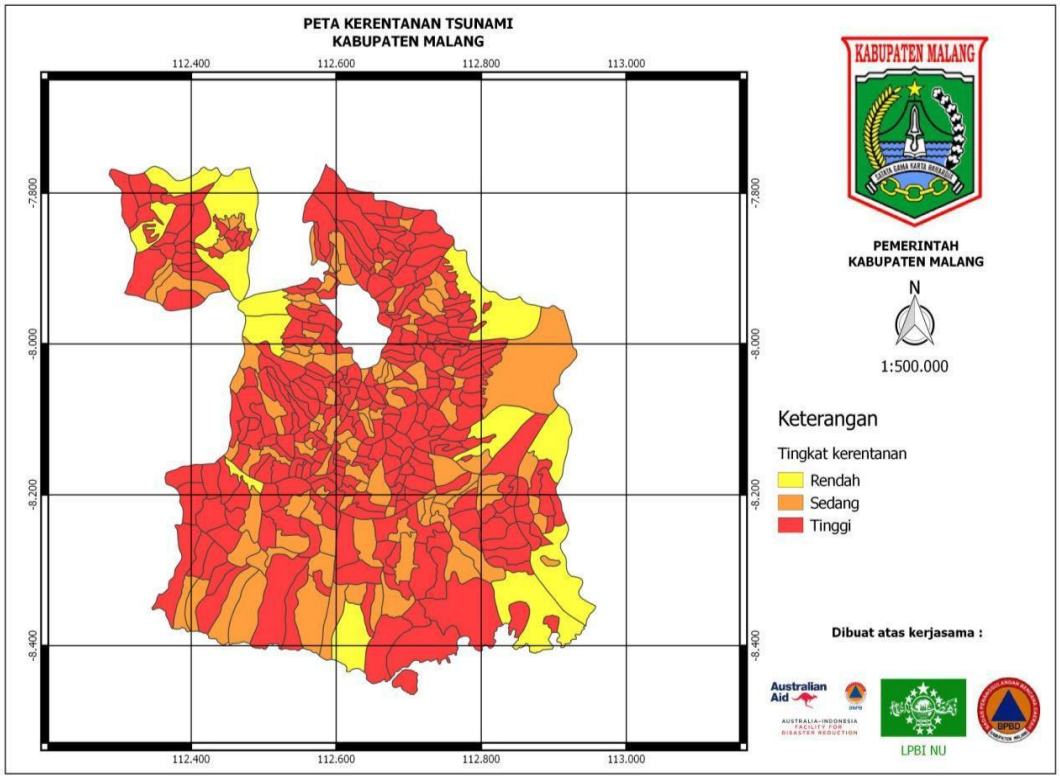


Gambar 10.8 Peta Kerentanan Banjir Kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

2. Tsunami

Kabupaten Malang termasuk kabupaten yang teridentifikasi sebagai rentan terhadap ancaman tsunami. Beberapa wilayah di Kabupaten Malang memiliki tingkat kerentanan tinggi yaitu wilayah Kecamatan Ampel Gading, Tirtoyudo, Sumbermanjing Wetan, Gedangan, Bantur, dan Donomulyo sebagaimana dapat dilihat pada **Gambar 10. 9**

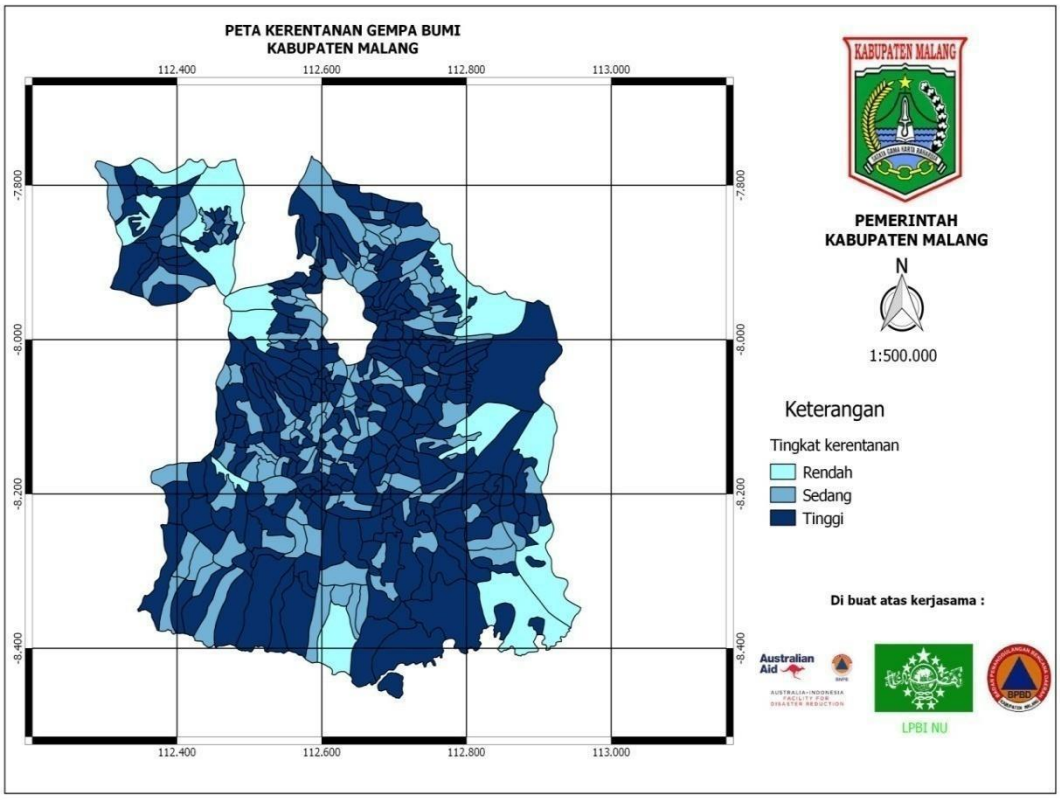


Gambar 10.9 Peta Kerentanan Tsunami Kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

3. Gempa Bumi

Kerentanan untuk ancaman gempa bumi di Kabupaten Malang secara umum termasuk ke dalam tingkat tinggi, seperti dapat dilihat pada **Gambar 10.10** Namun masih terdapat area di beberapa kecamatan yang memiliki tingkat kerentanan rendah; antara lain di wilayah Kecamatan Ampelgading,Tirtoyudo, Gedangan, Wajak, Jabung, Dau, Pujon, dan Kasembon.

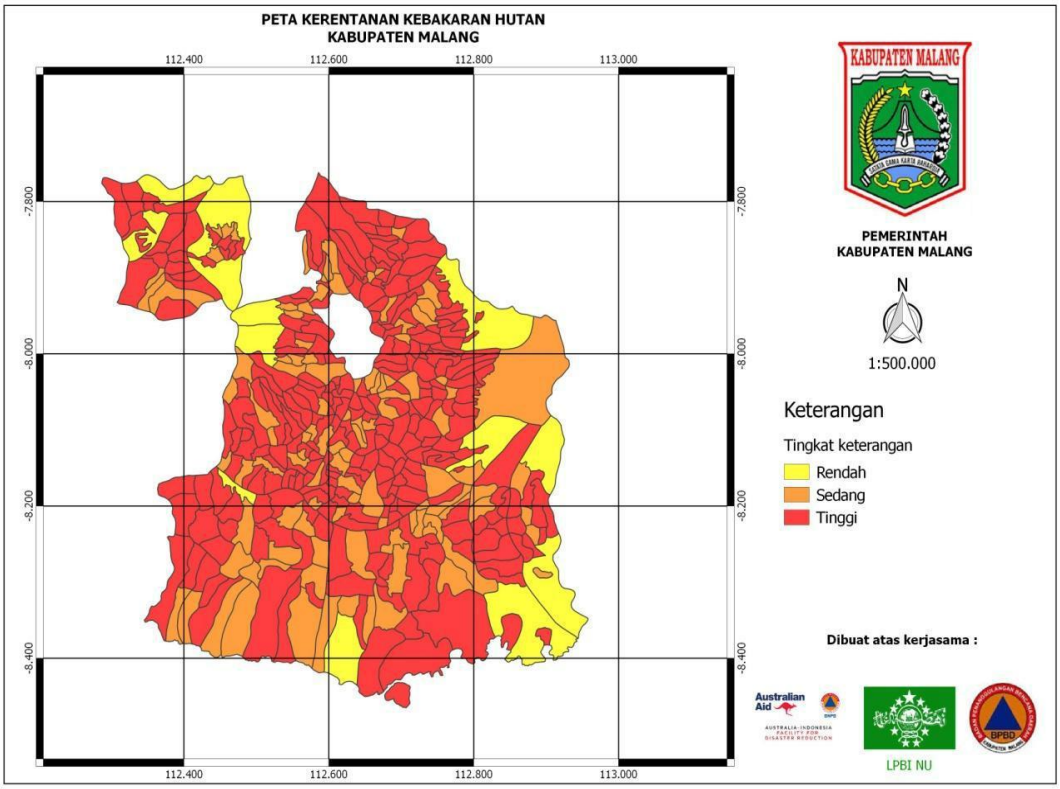


Gambar 10.10 Peta Kerentanan Gempa Bumi Kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

4. Kebakaran Hutan dan Lahan

Kerentanan untuk Kebakaran hutan di Kabupaten Malang secara umum tinggi, hal ini terjadi akibat ketidak pahaman dalam pengelolaan lahan hutan dapat menyebabkan kebakaran hutan,. kawasan hutan yang gundul dimana pada musim kemarau dapat memicu terjadinya kebakaran hutan dan serta kelalaian manusia juga bisa menyebabkan terjadinya kebakaran hutan.

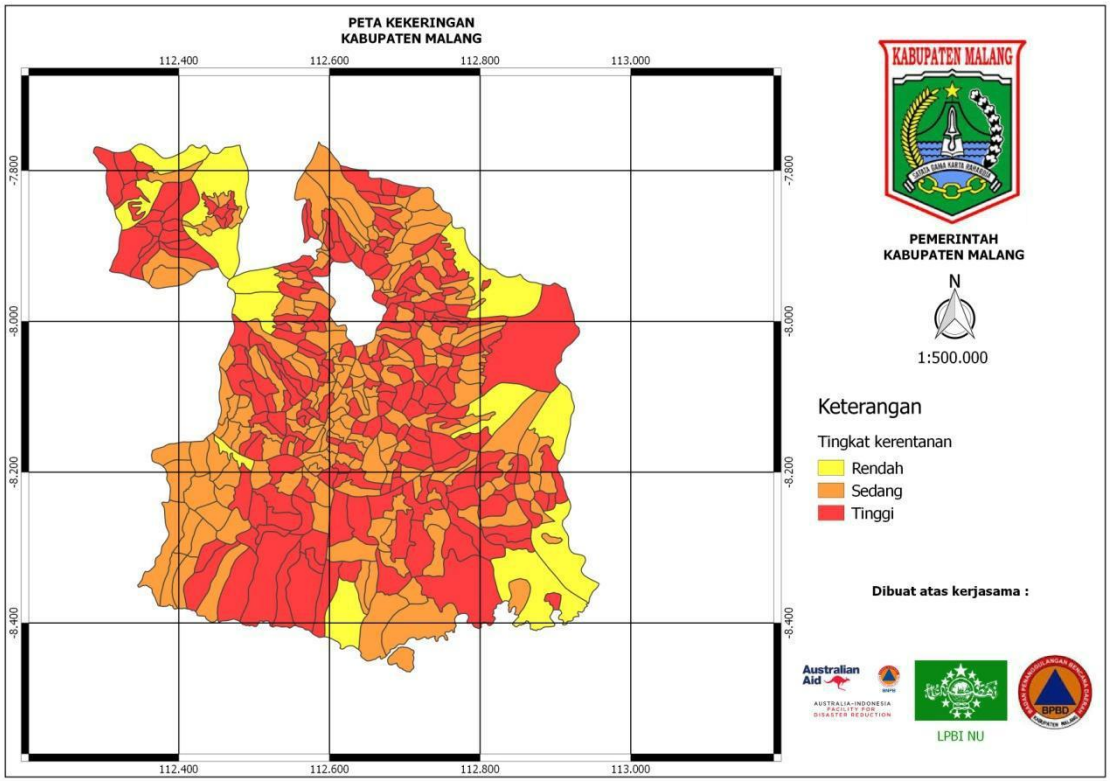


Gambar 10.11 Peta Kerentanan Kebakaran Hutan Kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

5. Kekeringan

Kerentanan untuk ancaman kekeringan di Kabupaten Malang secara umum termasuk ke dalam tingkat tinggi seperti terlihat pada **Gambar 10.12** Gambar tersebut juga menunjukkan bahwa masih terdapat beberapa area yang memiliki tingkat kerentanan sedang, antara lain di wilayah Kecamatan Ampel Gading, Tirtoyudo, Gedangan, Wajak, Jabung, Wagir, Dau, Pujon, dan Kasembon.



Gambar 10.12 Peta Kerentanan Kekeringan Kabupaten Malang

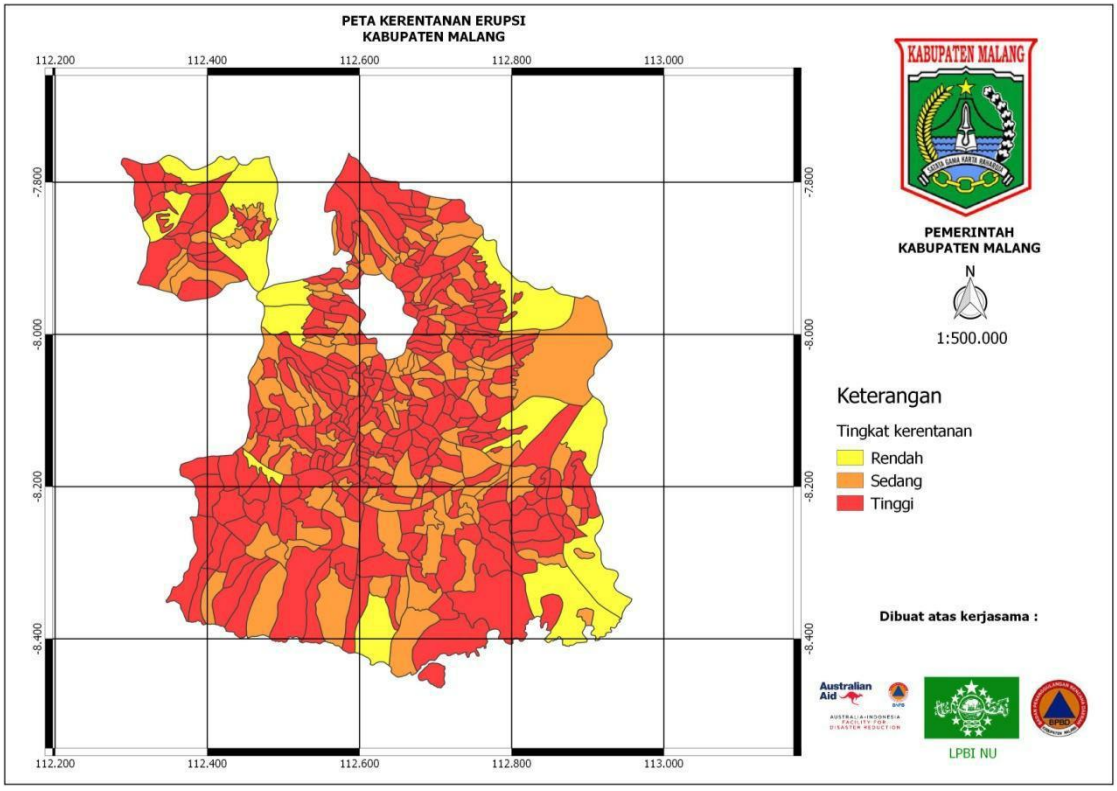
(*Sumber: Hasil Pemetaan , 2015)*

6. Epidemi dan Wabah Penyakit

Kerentanan untuk ancaman Epidemi dan Wabah Penyakit di kabupaten Malang secara umum termasuk ke dalam tingkat sedang.

7. Erupsi Gunung Api

Kerentanan kabupaten Malang terhadap ancaman letusan gunung api berada pada tingkat tinggi; dimana salah satu daerah yang memiliki tingkat kerentanan tinggi adalah Kecamatan Poncokusumo, Pujon, Ngantang, Kasembon, Ampel Gading, Tirtoyudo, dan Wajak.

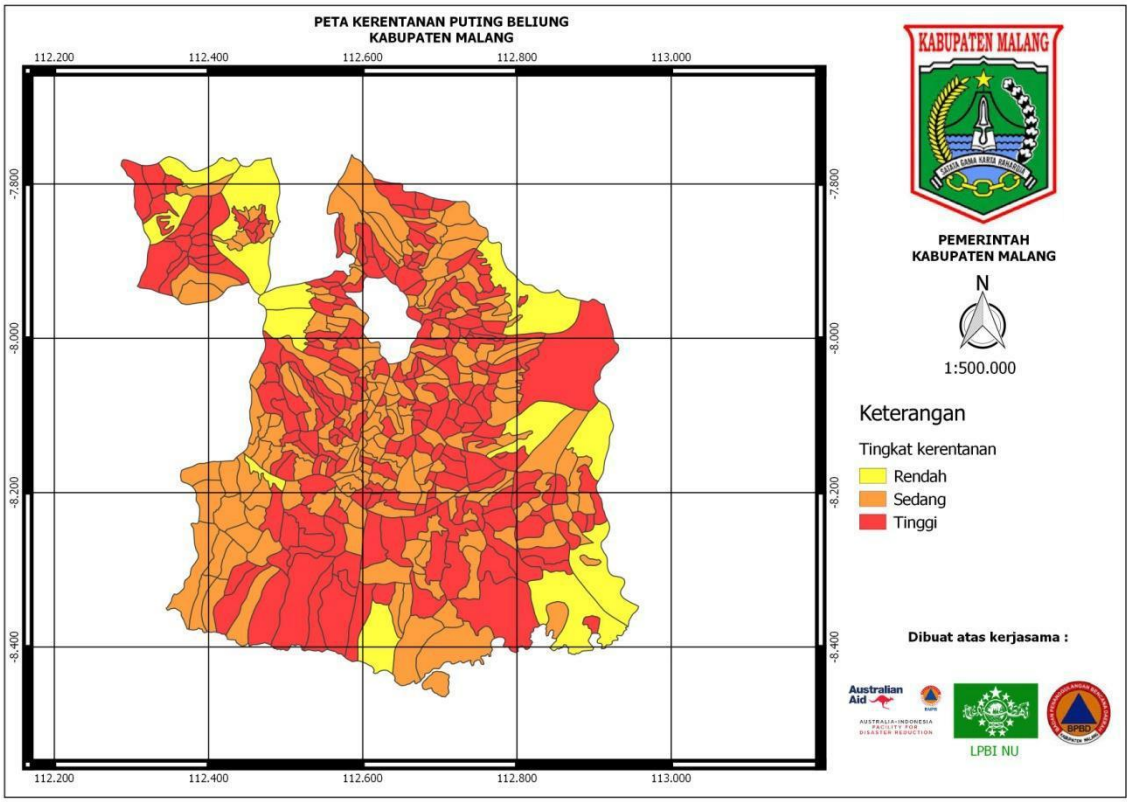


Gambar 10.13 Peta Kerentanan Erupsi Gunung Api Kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

8. Cuaca Ekstrem dan Puting Beliung

Kerentanan untuk bencana angin puting beliung di Kabupaten Malang secara umum termasuk ke dalam tingkat sedang. Beberapa area yang memiliki tingkat kerentanan Tinggi, antara lain beberapa Kecamatan Donomulyo, Pagak, Bantur, Tirtoyudo, Wajak, Pujon, Ngantang, Kasembon Wonosari, Lawang dll yang disebabkan kondisi wilayah kecamatan tersebut berbukit-bukit dan lapang yang menyebabkan angin kencang kerap melanda .

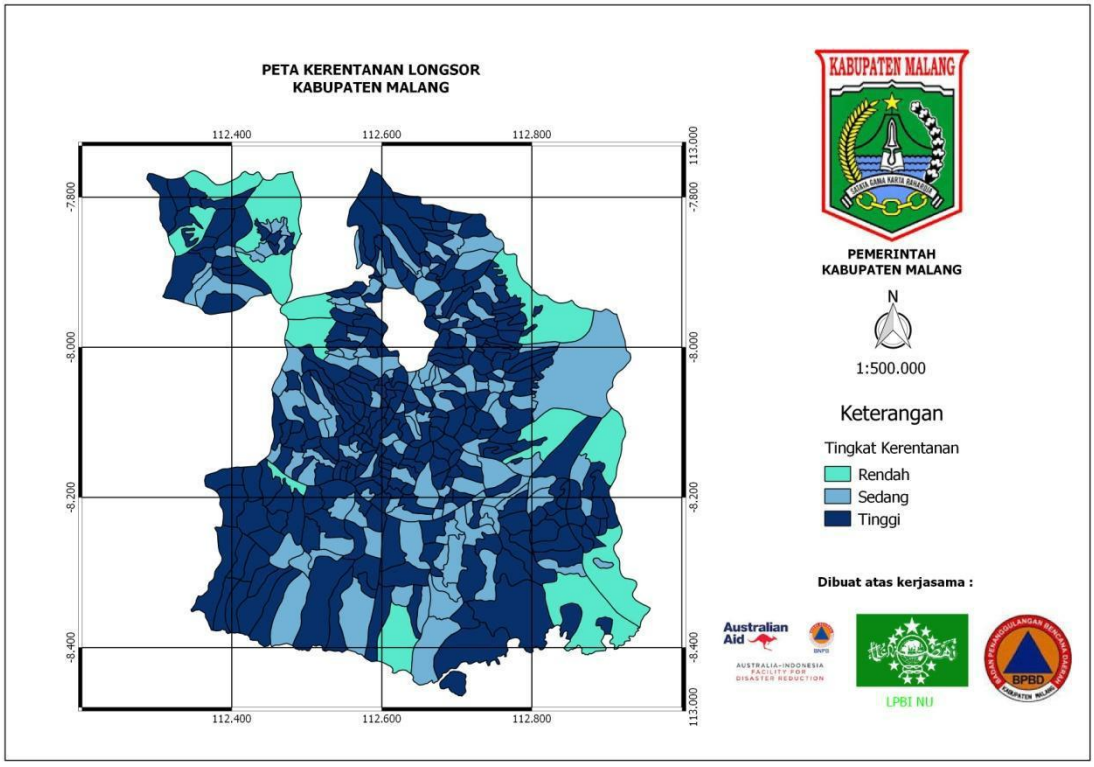


Gambar 10.14 Peta Kerentanan Puting Beliung Kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

9. Longsor

Kerentanan Kabupaten Malang terhadap ancaman longsor berada pada tingkat tinggi seperti wilayah Kecamatan, Lawang, Singosari, Kalipare, Donomulyo, Pagak, Bantur, Sumbermanjing Wetan, Ngantang, Kasembon dll. pada **Gambar 10.15** di wilayah pinggiran masih terdapat beberapa area yang memiliki tingkat kerentanan sedang, antara lain di wilayah Kecamatan Wajak,Sumbermanjing Wetan, Wagir, Kromengan, dan Singosari.



Gambar 10.15 Peta Kerentanan Longsor Kabupaten Malang

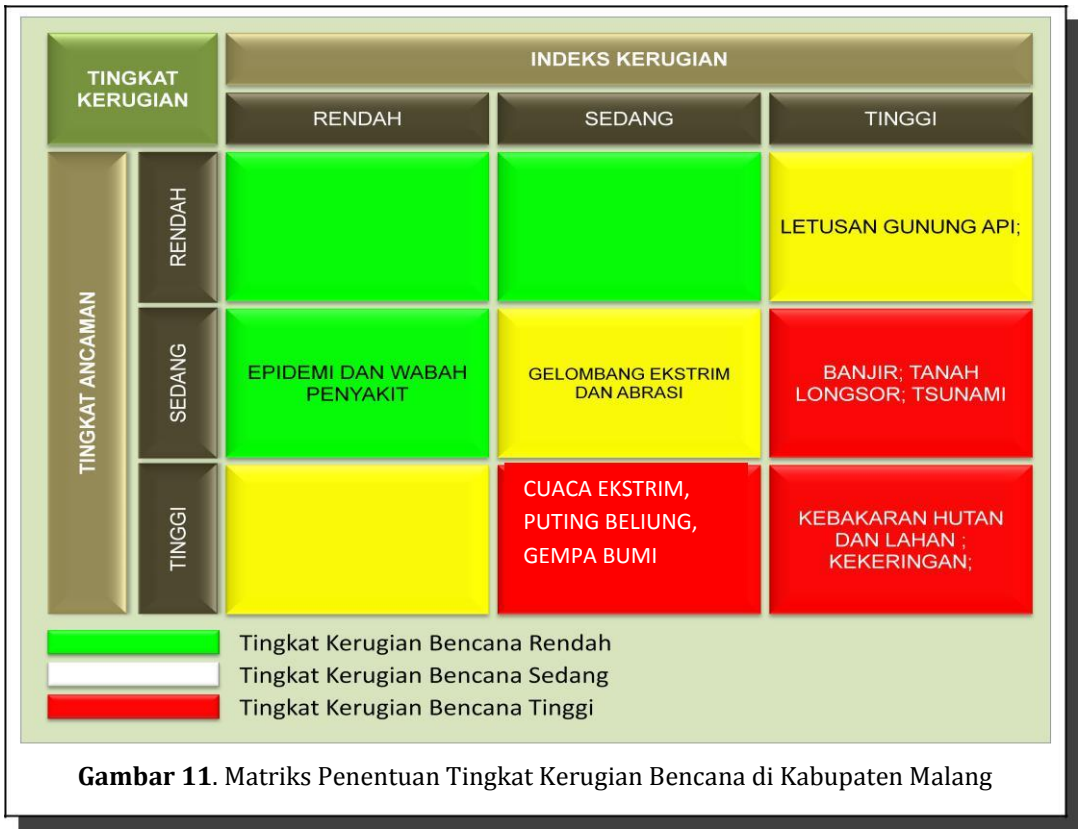
(*Sumber: Hasil Pemetaan , 2015)*

10. Gelombang Ekstrem dan Abrasi

Kerentanan Kabupaten Malang terhadap ancaman gelombang ekstrim dan abrasi berada pada tingkat tinggi antara lain di wilayah Kecamatan Ampel Gading, Tirtoyudo, Sumbermanjing Wetan, Gedangan, Bnatur, Donomulyo.

D. TINGKAT KERUGIAN

Bencana yang terjadi dapat menimbulkan kerugian. Kerugian ini dapat dilihat dari komponen ekonomi, fisik, dan lingkungan. Tingkat kerugian setiap bencana yang berpotensi di Kabupaten Malang seperti banjir, gempa bumi, cuaca ekstrim, puting beliung, tanah longsor, kebakaran hutan dan lahan, kekeringan, epidemi dan wabah penyakit diperoleh dengan menggabungkan tingkat ancaman dengan indeks kerugian, seperti gambar 11.



Gambar 11. Matriks Penentuan Tingkat Kerugian Bencana di Kabupaten Malang

Pada **Gambar 11** dapat dilihat bahwa tingkat kerugian setiap bencana yang berpotensi di Kabupaten Malang adalah:

1. Tingkat Kerugian bencana epidemi dan wabah penyakit adalah **RENDAH** Tingkat Kerugian ini dikategorikan rendah karena tingkat ancamannya adalah *sedang* dan indeks kerugiannya adalah *rendah*.
2. Tingkat Kerugian bencana gelombang ekstrim dan abrasi dan adalah **SEDANG**. Tingkat Kerugian ini dikategorikan sedang karena tingkat ancamannya adalah sedang dan indeks kerugiannya adalah sedang. Sedangkan untuk bencana letusan gunung api tingkat ancamannya adalah *rendah* dan tingkat kerugiannya *tinggi*.

3. Tingkat Kerugian bencana banjir, tanah longsor dan tsunami adalah **TINGGI**. Tingkat Kerugian ini dikategorikan tinggi karena tingkat ancamannya adalah *sedang* dan indeks kerugiannya juga *tinggi*. Sedangkan bencana cuaca ekstrim, puting beliung dan gempa bumi memiliki tingkat ancaman *tinggi* dan tingkat kerugiannya *sedang*.
4. Tingkat Kerugian bencana kebakaran hutan dan lahan, serta kekeringan adalah **TINGGI**. Tingkat Kerugian ini dikategorikan tinggi karena tingkat ancamannya adalah *tinggi* dan indeks kerugiannya juga *tinggi*.

Hasil pengkajian kerentanan bencana yang berpotensi terjadi di Kabupaten Malang dijelaskan dalam uraian berikut:

1. Banjir

Perhitungan tingkat kerugian bencana banjir di Kabupaten Malang dapat dilihat dari tingkat keterpaparan yang melingkupi Infrastruktur dan jumlah penduduk diperkirakan sebesar **32.15 Trilun rupiah** serta kerusakan lingkungan **1.275 Ha.** Sesuai dengan hasil analisa kajian risiko bencana Kabupaten Malang, tingkat kerugian bencana banjir adalah **TINGGI.** Hal ini dikarenakan tingkat ancaman banjir Kabupaten Malang adalah *sedang* dan indeks kerugian yang ditimbulkan adalah *tinggi*.

Catatan :

Kerusakan bangunan menurut Peraturan Menteri PU No. 45 Tahun 2007 adalah tidak berfungsinya bangunan atau komponen bangunan akibat penyusutan/berakhirnya umur bangunan, atau akibat ulah manusia atau perilaku alam seperti beban fungsi yang berlebih, kebakaran, gempa bumi, atau sebab lain yang sejenis. Intensitas kerusakan bangunan dapat digolongkan atas 3 (tiga) tingkat kerusakan, yaitu ;

a. Kerusakan Ringan, adalah kerusakan terutama pada komponen non-struktural, seperti penutup atap, langit-langit, penutup lantai dan dinding pengisi.
b. Kerusakan Sedang, adalah kerusakan pada sebagian komponen non-struktural, dan atau komponen struktural seperti struktur atap, lantai dan lain-lain.

c. Kerusakan Berat, adalah kerusakan pada sebagian besar komponen bangunan, baik struktural maupun non-struktural yang apabila setelah diperbaiki masih dapat berfungsi dengan baik sebagaimana mestinya.

Sedangkan perawatan bangunan adalah usaha memperbaiki kerusakan yang terjadi agar bangunan dapat berfungsi dengan baik sebagaimana mestinya. Perawatan bangunan dapat digolongkan sesuai dengan tingkat kerusakan pada bangunan. Besarnya biaya perawatan disesuaikan dengan tingkat kerusakannya, yang ditentukan sebagai berikut ;

a. Perawatan tingkat kerusakan ringan, biayanya maksimum adalah sebesar 30% dari harga satuan tertinggi pembangunan bangunan gedung baru yang berlaku, untuk tipe/klas dan lokasi yang sama.

b. Perawatan tingkat kerusakan sedang, biayanya maksimum adalah sebesar 45% dari harga satuan tertinggi pembangunan bangunan gedung baru yang berlaku, untuk tipe/klas dan lokasi yang sama.

c. Perawatan tingkat kerusakan berat, biayanya maksimum adalah sebesar 65% dari harga satuan tertinggi pembangunan bangunan gedung baru yang berlaku, untuk tipe/klas dan lokasi yang sama.

Valuasi risiko infrsatuktur berisiko rendah Banjir dalam bentuk rupiah di Kab. Malang

Risiko	Infrastuktur	Jumlah	Bentuk Risiko	Perkiraan Biaya	Valuasi Risiko dalam (Rp)
Rendah	KLINIK / DOKTER	12	Rusak Ringan, adalah kerusakan terutama pada komponen non-struktural, seperti penutup atap, langit-langit, penutup lantai dan dinding pengisi	5.000.000	60.000.000
Rendah	Kantor Pemerintahan	30		5.000.000	150.000.000
Rendah	Rumah Sakit	6		5.000.000	30.000.000
Rendah	Wihara	3		5.000.000	15.000.000
Rendah	Masjid / Langgar	30		5.000.000	150.000.000
Rendah	Rumah	9720		5.000.000	48.600.000.000
Rendah	Sekolah	57		5.000.000	285.000.000
Rendah	Fasilitas Olahraga	9		5.000.000	45.000.000
Rendah	Pasar	3		5.000.000	15.000.000
Rendah	Universitas			5.000.000	-
	TOTAL	9870			**49.350.000.000**

Valuasi risiko infrsatuktur berisiko Sedang Banjir dalam bentuk rupiah di Kab. Malang

Risiko	Infrastuktur	Jumlah	Bentuk Risiko	Perkiraan Biaya	Valuasi Risiko dalam (Rp)
Sedang	KLINIK / DOKTER	60	Rusak Sedang, adalah kerusakan pada sebagian komponen non-struktural, dan atau komponen struktural seperti struktur atap, lantai dll.	18.000.000	1.080.000.000
Sedang	Kantor Pemerintahan	87		18.000.000	1.566.000.000
Sedang	Rumah Sakit	12		18.000.000	216.000.000
Sedang	Wihara			18.000.000	-
Sedang	Masjid / Langgar	303		18.000.000	5.454.000.000
Sedang	Rumah	40998		18.000.000	737.964.000.000
Sedang	Sekolah	195		18.000.000	3.510.000.000
Sedang	Fasilitas Olahraga	12		18.000.000	216.000.000
Sedang	Pasar	6		18.000.000	108.000.000
Sedang	Universitas	3		18.000.000	54.000.000
	TOTAL	41676			**750.168.000.000**

Valuasi risiko infrsatuktur berisiko Tinggi Banjir dalam bentuk rupiah di Kab. Malang

Risiko	Infrastuktur	Jumlah	Bentuk Risiko	Perkiraan Biaya	Valuasi Risiko dalam (Rp)
Tinggi	KLINIK / DOKTER	27	Rusak Berat, adalah kerusakan pada sebagian besar komponen bangunan, baik struktural maupun non-struktural yang apabila diperbaiki masih dapat berfungsi dengan baik sebagaimana mestinya	36.000.000	972.000.000
Tinggi	Kantor Pemerintahan	39		36.000.000	1.404.000.000
Tinggi	Rumah Sakit	6		36.000.000	216.000.000
Tinggi	Wihara			36.000.000	-
Tinggi	Masjid / Langgar	177		36.000.000	6.372.000.000
Tinggi	Rumah	30928		36.000.000	1.113.408.000.000
Tinggi	Sekolah	90		36.000.000	3.240.000.000
Tinggi	Fasilitas Olahraga	3		36.000.000	108.000.000
Tinggi	Pasar	6		36.000.000	216.000.000
Tinggi	Universitas	3		36.000.000	108.000.000
	TOTAL	31279			**1.126.044.000.000**

Valuasil potensi risiko berdasarkan skenario 50 % penduduk yang berisiko terhadap banir bandang di Kabupaten Malang

Risiko	Jiwa	Bentuk Risiko	Perkiraan Biaya	Valuasi Risiko Jiwa (Rp)
Rendah	461.728	50 % Cedera Ringan	2.000.000	461.728.000.000
Sedang	1247216	50 % Cedera Berat	5.000.000	3.118.040.000.000
Tinggi	532.931	50 % Meninggal Dunia atau Cacat Seumur Hidup	100.000.000	26.646.550.000.000
Total	2.241.875	Total		**30.226.318.000.000**

2. Gelombang Ekstrim dan Abrasi

Perhitungan tingkat kerugian bencana gelombang ekstrim dan abrasi di Kabupaten Malang dapat dilihat dari tingkat ancaman dan indeks kerugian bencana gelombang ekstrim dan abrasi. Indeks kerugian tersebut dilihat dari kerugian ekonomi, fisik, dan lingkungan yang ditimbulkan. Jumlah kerugian ekonomi dan fisik yang ditimbulkan diperkirakan sebesar **116,91 miliar rupiah** serta kerusakan lingkungan **4.108 Ha.** Sesuai dengan hasil analisa kajian risiko bencana Kabupaten Malang, tingkat kerugian bencana gelombang ekstrim dan abrasi adalah **SEDANG.** Hal ini dikarenakan tingkat ancaman gelombang ekstrim dan abrasi Kabupaten Malang adalah *sedang* dan indeks kerugian yang ditimbulkan adalah *sedang*.

3. Gempa Bumi

Perhitungan tingkat kerugian bencana Gempa Bumi di Kabupaten Malang dapat dilihat dari tingkat keterpaparan yang melingkupi Infrastruktur dan jumlah penduduk diperkirakan diperkirakan sebesar **46,93 triliun rupiah.** Sesuai dengan hasil analisa kajian risiko bencana Kabupaten Malang, tingkat kerugian bencana gempa bumi adalah **TINGGI.** Hal ini dikarenakan tingkat ancaman gempa bumi Kabupaten Malang adalah *tinggi* dan indeks kerugian yang ditimbulkan adalah *sedang*.

Valuasi risiko infrsatuktur berisiko rendah gempa bumi dalam bentuk rupiah di Kab. Malang

Risiko	Infrastuktur	Jumlah	Bentuk Risiko	Perkiraan Biaya	Valuasi Risiko dalam (Rp)
Rendah	KLINIK / DOKTER		Rusak Ringan, adalah kerusakan terutama pada komponen non-struktural, seperti penutup atap, langit-langit, penutup lantai dan dinding pengisi	5.000.000	-
Rendah	Kantor Pemerintahan			5.000.000	-
Rendah	Rumah Sakit			5.000.000	-
Rendah	Wihara			5.000.000	-
Rendah	Masjid / Langgar			5.000.000	-
Rendah	Rumah	810		5.000.000	4.050.000.000
Rendah	Sekolah			5.000.000	-
Rendah	Fasilitas Olahraga			5.000.000	-
Rendah	Pasar			5.000.000	-
Rendah	Universitas			5.000.000	-
			TOTAL		**4.050.000.000**

Valuasi risiko infrsatuktur berisiko Sedang gempa bumi dalam bentuk rupiah di Kab. Malang

Risiko	Infrastuktur	Jumlah	Bentuk Risiko	Perkiraan Biaya	Valuasi Risiko dalam (Rp)
Sedang	KLINIK / DOKTER	18	Rusak Sedang, adalah kerusakan pada sebagian komponen non-struktural, dan atau komponen struktural seperti struktur atap, lantai dll.	18.000.000	324.000.000
Sedang	Kantor Pemerintahan	36		18.000.000	648.000.000
Sedang	Rumah Sakit	5		18.000.000	90.000.000
Sedang	Wihara	1		18.000.000	18.000.000
Sedang	Masjid / Langgar	105		18.000.000	1.890.000.000
Sedang	Rumah	15033		18.000.000	270.594.000.000
Sedang	Sekolah	77		18.000.000	1.386.000.000
Sedang	Fasilitas Olahraga	7		18.000.000	126.000.000
Sedang	Pasar	4		18.000.000	72.000.000
Sedang	Universitas	2		18.000.000	36.000.000
			TOTAL		**275.184.000.000**

Valuasi risiko infrsatuktur berisiko Tinggi gempa bumi dalam bentuk rupiah di Kab. Malang

Risiko	Infrastuktur	Jumlah	Bentuk Risiko	Perkiraan Biaya	Valuasi Risiko dalam (Rp)
Tinggi	KLINIK / DOKTER	11	Rusak Berat, adalah kerusakan pada sebagian besar komponen bangunan, baik struktural maupun non-struktural yang apabila diperbaiki masih dapat berfungsi dengan baik sebagaimana mestinya	36.000.000	396.000.000
Tinggi	Kantor Pemerintahan	6		36.000.000	216.000.000
Tinggi	Rumah Sakit			36.000.000	-
Tinggi	Wihara			36.000.000	-
Tinggi	Masjid / Langgar	50		36.000.000	1.800.000.000
Tinggi	Rumah	10948		36.000.000	394.128.000.000
Tinggi	Sekolah	17		36.000.000	612.000.000
Tinggi	Fasilitas Olahraga	1		36.000.000	36.000.000
Tinggi	Pasar	4		36.000.000	144.000.000
Tinggi	Universitas	2		36.000.000	72.000.000
			TOTAL		**397.404.000.000**

Valuasi potensi ririko berdasarkan skenario 50 % penduduk yang beresiko Terhadap gempa bumi di Kabupaten Malang

Risiko	Jiwa	Bentuk Risiko	Perkiraan Biaya	Valuasi Risiko Jiwa (Rp)
Rendah	4.530	50 % Cedera Ringan	2.000.000	4.530.000.000
Sedang	1.388.832	50 % Cedera Berat	5.000.000	3.472.080.000.000
Tinggi	855.574	50 % Meninggal Dunia atau Cacat Seumur Hidup	100.000.000	42.778.700.000.000
TOTAL	**2.248.936**			**46.255.310.000.000**

4. Kebakaran Hutan dan Lahan

Perhitungan tingkat kerugian bencana kebakaran hutan dan lahan di Kabupaten Malang dapat dilihat dari tingkat ancaman dan indeks kerugian bencana kebakaran hutan dan lahan. Indeks kerugian tersebut dilihat dari kerugian ekonomi, fisik, dan lingkungan yang ditimbulkan. Jumlah kerugian ekonomi dan fisik yang ditimbulkan diperkirakan sebesar **16,69 triliun rupiah** serta kerusakan lingkungan **825 Ha.** Sesuai dengan hasil analisa kajian risiko bencana Kabupaten Malang, tingkat kerugian bencana kebakaran hutan dan lahan adalah **TINGGI.** Hal ini dikarenakan tingkat ancaman kebakaran hutan dan lahan Kabupaten Malang adalah *tinggi* dan indeks kerugian yang ditimbulkan adalah *tinggi*.

5. Kekeringan

Perhitungan tingkat kerugian bencana kekeringan di Kabupaten Malang dapat dilihat dari tingkat keterpaparan yang melingkupi Infrastruktur dan jumlah penduduk diperkirakan diperkirakan sebesar **137,98 miliar rupiah** serta kerusakan lingkungan **45.916 Ha.** Sesuai dengan hasil analisa kajian risiko bencana Kabupaten Malang, tingkat kerugian bencana kekekringan adalah **TINGGI.** Hal ini dikarenakan tingkat ancaman kekeringan Kabupaten Malang adalah *tinggi* dan indeks kerugian yang ditimbulkan adalah *tinggi*.

Valuasi potensi risiko berdasarkan skenario 50 % penduduk yang berisiko terhadap kekeringan di Kabupaten Malang

Risiko	Jiwa	Bentuk Risiko	Perkiraan Biaya	Valuasi Risiko Jiwa (Rp)
Rendah	46.953	50 % Hanya mampu memenuhi kebutuhan akan air bersih 75 % dari kebutuhan	45.000	1.056.442.500
Sedang	941620	50 % Hanya mampu memenuhi kebutuhan akan air bersih 50 % dari kebutuhan	90.000	42.372.900.000
Tinggi	1.400.693	50 % Hanya mampu memenuhi kebutuhan akan air bersih 25 % dari kebutuhan	135.000	94.546.777.500
Total	2.389.266			137.976.120.000

Catatan :

1. Asumsi kebutuhan air bersih untuk Minum, Mandi,cuci, kakus per Orang adalah 40 Liter/ hari
2. Harga air 40 liter adalah Rp. 6.000
3. Valuasi Risiko Jiwa dihitung untuk kebutuhan 30 hari

6. Epidemi dan Wabah Penyakit

Perhitungan tingkat kerugian bencana epidemi dan wabah penyakit di Kabupaten Malang dapat dilihat dari tingkat ancaman dan indeks kerugian bencana epidemi dan wabah penyakit. Indeks kerugian tersebut dilihat dari kerugian ekonomi, fisik, dan lingkungan yang ditimbulkan. Jumlah kerugian ekonomi dan fisik yang ditimbulkan diperkirakan sebesar **22,58 triliun rupiah (sesuai data BNPB)** serta kerusakan lingkungan **81.894 Ha.** Sesuai dengan hasil analisa kajian risiko bencana Kabupaten Malang, tingkat kerugian bencana epidemi dan wabah penyakit adalah **TINGGI.** Hal ini dikarenakan tingkat ancaman epidemi dan wabah penyakit Kabupaten Malang adalah *sedang* dan indeks kerugian yang ditimbulkan adalah *tinggi*.

7. Letusan Gunung Api

Perhitungan tingkat kerugian bencana letusan gunung api di Kabupaten Malang dapat dilihat dari tingkat ancaman dan indeks kerugian bencana letusan gunung api. Indeks kerugian tersebut dilihat dari kerugian ekonomi, fisik, dan lingkungan yang ditimbulkan. Jumlah kerugian ekonomi dan fisik yang ditimbulkan diperkirakan sebesar Rp. 4.491.280.000.000 serta kerusakan lingkungan **252 Ha.** Sesuai dengan hasil analisa kajian risiko bencana Kabupaten Malang, tingkat kerugian bencana letusan gunung api adalah **TINGGI.** Hal ini dikarenakan tingkat ancaman letusan gunung api Kabupaten Malang adalah *sedang* dan indeks kerugian yang ditimbulkan adalah *tinggi*.

Valuasi risiko infrastruktur resiiko rendah dalam bentuk rupiah di Kabupaten Malang

RISIKO	NFRASTRUKTUR	JUMLAH	BENTUK RISIKO	PERKIRAAN BIAYA	VALUASI RISIKO DALAM (Rp)
Rendah	KLINIK / DOKTOR	0	Rusak Ringan, adalah kerusakan terutama pada komponen non-struktural, seperti penutup atap, langit-langit, penutup lantai dan dinding pengisi	18.000.000	-
Rendah	KANTOR PEMERINTAHAN	0		18.000.000	-
Rendah	VIHARA	0		18.000.000	-
Rendah	MASJID / MUSHOLAH	0		18.000.000	-
Rendah	PERUMAHAN	222		18.000.000	3.996.000.000
Rendah	SEKOLAH	0		18.000.000	-
Rendah	PASAR	0		18.000.000	-
	TOTAL	222			3.996.000.000

Valuasi risiko infrastruktur berisiko sedang dalam bentuk rupiah di Kabupaten Malang

RISIKO	NFRASTRUKTUR	JUMLAH	BENTUK RISIKO	PERKIRAAN BIAYA	VALUASI RISIKO DALAM (Rp)
Sedang	KLINIK / DOKTOR	13	Rusak Sedang, adalah kerusakan pada sebagian komponen non-struktural, dan atau komponen struktural seperti struktur atap, lantai dll.	36.000.000	468.000.000
Sedang	KANTOR PEMERINTAHAN	5		36.000.000	180.000.000
Sedang	VIHARA	1		36.000.000	36.000.000
Sedang	MASJID / MUSHOLAH	30		36.000.000	1.080.000.000
Sedang	PERUMAHAN	7800		36.000.000	280.800.000.000
Sedang	SEKOLAH	15		36.000.000	540.000.000
Sedang	PASAR	1		36.000.000	36.000.000
	TOTAL	7865			283.140.000.000

Valuasi risiko infrstruktur berisiko tinggi dalam bentuk rupiah di Kabupaten Malang

RISIKO	NFRASTRUKTUR	JUMLAH	BENTUK RISIKO	PERKIRAAN BIAYA	VALUASI RISIKO DALAM (Rp)
Tinggi	KLINIK / DOKTOR	13	Rusak Berat, adalah kerusakan pada sebagian besar komponen bangunan, baik struktural maupun non-struktural yang apabila diperbaiki masih dapat berfungsi dengan baik sebagaimana mestinya	75.000.000	975.000.000
Tinggi	KANTOR PEMERINTAHAN	0		75.000.000	-
Tinggi	VIHARA	0		75.000.000	-
Tinggi	MASJID / MUSHOLAH	2		75.000.000	150.000.000
Tinggi	PERUMAHAN	9279		75.000.000	695.925.000.000
Tinggi	SEKOLAH	0		75.000.000	-
Tinggi	PASAR	0		75.000.000	-
	TOTAL	9294			697.050.000.000

Valuasi risiko berdasarkan skenario 50 % penduduk yang berisiko terhadap Eurupsi di Kabupaten Malang

RISIKO	JIWA	BENTUK RISIKO	PERKIRAAN BIAYA	VALUASI RISIKO JIWA (Rp)
RENDAH	1779	50 % Cedera Ringan	2.000.000	1.779.000.000
SEDANG	249.546	50 % Cedera Berat	5.000.000	623.865.000.000
TINGGI	57.629	50 % Meninggal Dunia atau Cacat Seumur Hidup	100.000.000	2.881.450.000.000
JUMLAH	308.954			3.507.094.000.000

4. Keterangan : Perkiraan biaya berdasarkan perhitungan asuransi jiwa.

8. Cuaca Ekstrim & Puting beliung

Perhitungan tingkat kerugian bencana cuaca ekstrem dan Puting beliung di Kabupaten Malang dapat dilihat dari tingkat keterpaparan yang melingkupi Infrastruktur dan jumlah penduduk diperkirakan diperkirakan sebesar **20,46 triliun rupiah.** Sesuai dengan hasil analisa kajian risiko bencana Kabupaten Malang, tingkat kerugian bencana cuaca ekstrim adalah **TINGGI.** Hal ini dikarenakan tingkat ancaman kekeringan Kabupaten Malang adalah *tinggi* dan indeks kerugian yang ditimbulkan adalah *sedang*.

Valuasi risiko infrsatuktur berisiko rendah puting beliung dalam bentuk rupiah di Kab. Malang

Risiko	Infrastuktur	Jumlah	Bentuk Risiko	Perkiraan Biaya	Valuasi Risiko dalam (Rp)
Rendah	KLINIK / DOKTER		Rusak Ringan, adalah kerusakan terutama pada komponen non-struktural, seperti penutup atap, langit-langit, penutup lantai dan dinding pengisi	5.000.000	-
Rendah	Kantor Pemerintahan			5.000.000	-
Rendah	Rumah Sakit			5.000.000	-
Rendah	Wihara			5.000.000	-
Rendah	Masjid / Langgar			5.000.000	-
Rendah	Rumah	810		5.000.000	4.050.000.000
Rendah	Sekolah			5.000.000	-
Rendah	Fasilitas Olahraga			5.000.000	-
Rendah	Pasar			5.000.000	-
Rendah	Universitas			5.000.000	-
			TOTAL		**4.050.000.000**

Valuasi risiko infrsatuktur berisiko Sedang puting beliung dalam bentuk rupiah di Kab. Malang

Risiko	Infrastuktur	Jumlah	Bentuk Risiko	Perkiraan Biaya	Valuasi Risiko dalam (Rp)
Sedang	KLINIK / DOKTER	20	Rusak Sedang, adalah kerusakan pada sebagian komponen non-struktural, dan atau komponen struktural seperti struktur atap, lantai dll.	18.000.000	360.000.000
Sedang	Kantor Pemerintahan	37		18.000.000	666.000.000
Sedang	Rumah Sakit	5		18.000.000	90.000.000
Sedang	Wihara	1		18.000.000	18.000.000
Sedang	Masjid / Langgar	114		18.000.000	2.052.000.000
Sedang	Rumah	23077		18.000.000	415.386.000.000
Sedang	Sekolah	76		18.000.000	1.368.000.000
Sedang	Fasilitas Olahraga	7		18.000.000	126.000.000
Sedang	Pasar	4		18.000.000	72.000.000
Sedang	Universitas	1		18.000.000	18.000.000
			TOTAL		**420.156.000.000**

Valuasi risiko infrsatuktur berisiko Tinggi puting beliung dalam bentuk rupiah di Kab. Malang

Risiko	Infrastuktur	Jumlah	Bentuk Risiko	Perkiraan Biaya	Valuasi Risiko dalam (Rp)
Tinggi	KLINIK / DOKTER	9	Rusak Berat, adalah kerusakan pada sebagian besar komponen bangunan, baik struktural maupun non-struktural yang apabila diperbaiki masih dapat berfungsi dengan baik sebagaimana mestinya	36.000.000	324.000.000
Tinggi	Kantor Pemerintahan	5		36.000.000	180.000.000
Tinggi	Rumah Sakit			36.000.000	-
Tinggi	Wihara			36.000.000	-
Tinggi	Masjid / Langgar	41		36.000.000	1.476.000.000
Tinggi	Rumah	2900		36.000.000	104.400.000.000
Tinggi	Sekolah	18		36.000.000	648.000.000
Tinggi	Fasilitas Olahraga	1		36.000.000	36.000.000
Tinggi	Pasar	4		36.000.000	144.000.000
Tinggi	Universitas	1		36.000.000	36.000.000
			TOTAL		**107.244.000.000**

Aluasi risiko berdasarkan 50 % penduduk yang memiliki potensi berisiko terhadap puting beliung di Kabupaten Malang

RISIKO	JIWA	BENTUK RISIKO	PERKIRAAN BIAYA	VALUASI RISIKO JIWA (Rp)
RENDAH		50 % Cedera Ringan	2.000.000	-
SEDANG	1.944.456	50 % Cedera Berat	5.000.000	4.861.140.000.000
TINGGI	301.411	50 % Meninggal Dunia atau Cacat Seumur Hidup	100.000.000	15.070.550.000.000
Total	2.245.867			19.931.690.000.000

9. Tanah Longsor

Perhitungan tingkat kerugian bencana tanah longsor di Kabupaten Malang dapat dilihat dari tingkat ancaman dan indeks kerugian bencana tanah longsor. Indeks kerugian tersebut dilihat dari kerugian ekonomi, fisik, dan lingkungan yang ditimbulkan. Jumlah kerugian ekonomi dan fisik yang ditimbulkan diperkirakan sebesar **46,49 miliar rupiah** serta kerusakan lingkungan **4.619 Ha.** Sesuai dengan hasil analisa kajian risiko bencana Kabupaten Malang, tingkat kerugian bencana tanah longsor adalah **TINGGI.** Hal ini dikarenakan tingkat ancaman tanah longsor Kabupaten Malang adalah *sedang* dan indeks kerugian yang ditimbulkan adalah *tinggi*.

10. Tsunami

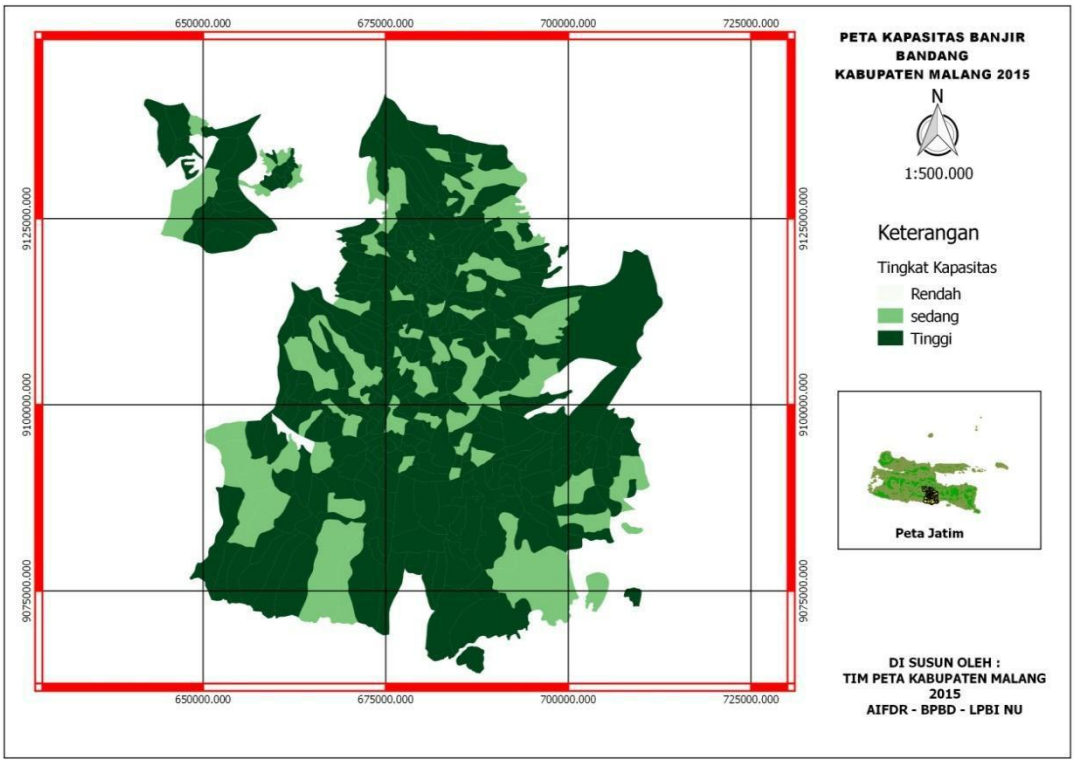
Perhitungan tingkat kerugian bencana tsunami di Kabupaten Malang dapat dilihat dari tingkat ancaman dan indeks kerugian bencana tsunami. Indeks kerugian tersebut dilihat dari kerugian ekonomi, fisik, dan lingkungan yang ditimbulkan. Jumlah kerugian ekonomi dan fisik yang ditimbulkan diperkirakan sebesar **94,47 miliar rupiah** serta kerusakan lingkungan **1.506 Ha.** Sesuai dengan hasil analisa kajian risiko bencana Kabupaten Malang, tingkat kerugian bencana tsunami adalah **TINGGI.** Hal ini dikarenakan tingkat ancaman tsunami Kabupaten Malang adalah *sedang* dan indeks kerugian yang ditimbulkan adalah *tinggi*.

E. TINGKAT KAPASITAS

Tinggi rendahnya risiko bencana yang dihadapi oleh masyarakat tentunya bergantung pada kapasitas masyarakat dalam menghadapinya. Kabupaten Malang terbagi atas 33 Kecamatan; dimana setiap Kecamatan tentu memiliki kapasitas yang berbeda dalam upaya penurunan risiko bencana. Perbedaan kapasitas tersebut akan bergantung kepada komitmen daerah, sumber daya (baik dalam bentuk infrastruktur, manusia, maupun finansial), karakteristik daerah serta potensi bencana di daerah tersebut.

1. Banjir

Kapasitas bencana banjir di Kabupaten Malang terbagi atas 2 tingkatan yaitu tinggi dan sedang, Tingkat Kapasitas tinggi ada di Hampir Seluruh Kecamatan. Sementara daerah dengan tingkat kapasitas sedang ada di kecamatan Kalipare, Bantur, Tirtoyudo, Singosari, Ngantang, dan Karangploso.



Gambar 11.1 Peta Kapasitas Banjir Kabupaten Malang

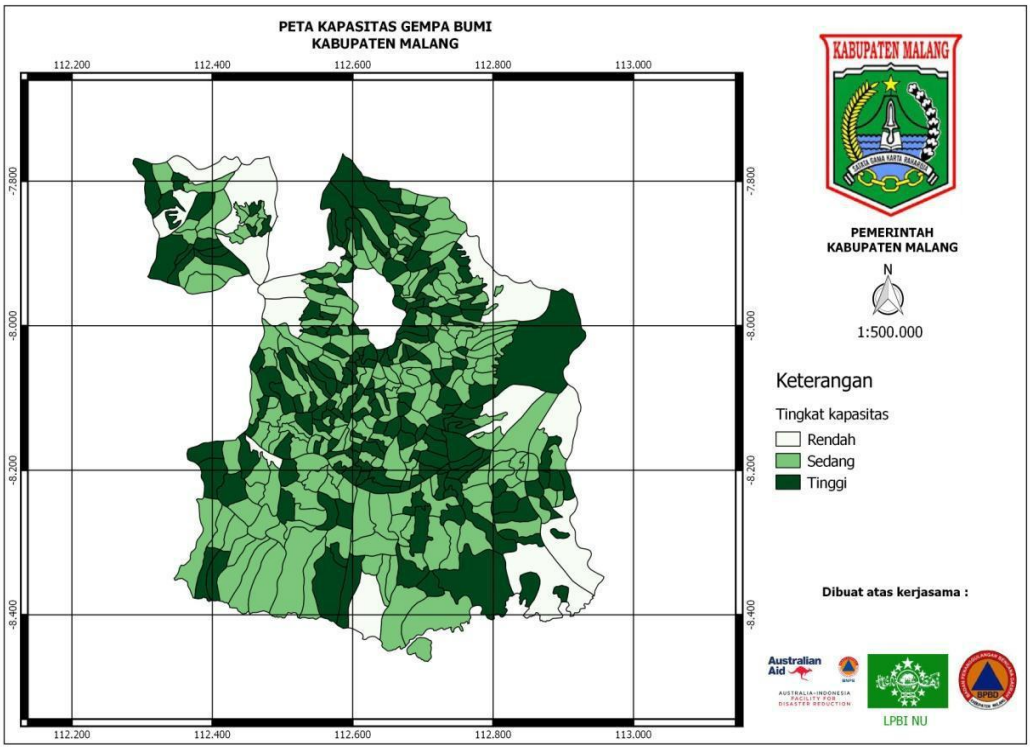
(*Sumber: Hasil Pemetaan , 2015)*

2. Gelombang Ekstrim dan Abrasi

Tingkat kapasitas bencana Gelombang Ekstrim dan Abrasi di Kabupaten Malang berada pada tingkat sedang antara lain di wilayah Kecamatan Ampel Gading, Tirtoyudo, Sumbermanjing Wetan, Gedangan, Bantur, Donomulyo.

3. Gempa Bumi

Tingkat kapasitas bencana gempa bumi Kabupaten Malang seperti terlihat dalam peta kapasitas bencana kabupaten Malang, secara umum menunjukkan kapasitas yang sedang, ada beberapa daerah seperti Kecamatan Lawang, Poncokusumo, Bnatur, Tirtoyudo Ngnatang, dan Dampit yang memiliki kapasitas tinggi.



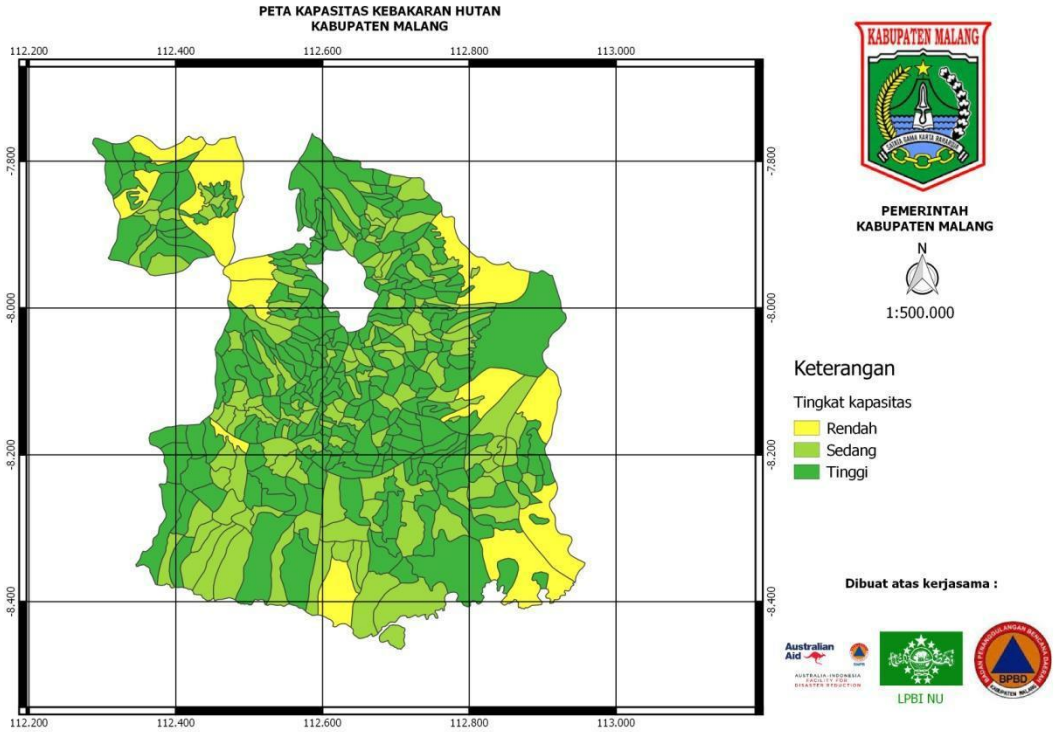
Gambar 11.2 Peta Kapasitas Gempa Bumi Kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

4. Kebakaran Hutan dan Lahan

Merupakan bahaya terbakar pada tempat dimana terdapat bahan-bahan yang mempunyai nilai kemudahan terbakar tinggi dan apabila terjadi kebakaran melepaskan panas sangat tinggi dan menjalarnya api sangat cepat.

Berdasarkan peta kapasitas kebakaran di Wilayah Kabupaten Malang pada umumnya kapasitas Kebakaran Hutan dan Lahan menunjukkan angka yang masih tinggi.

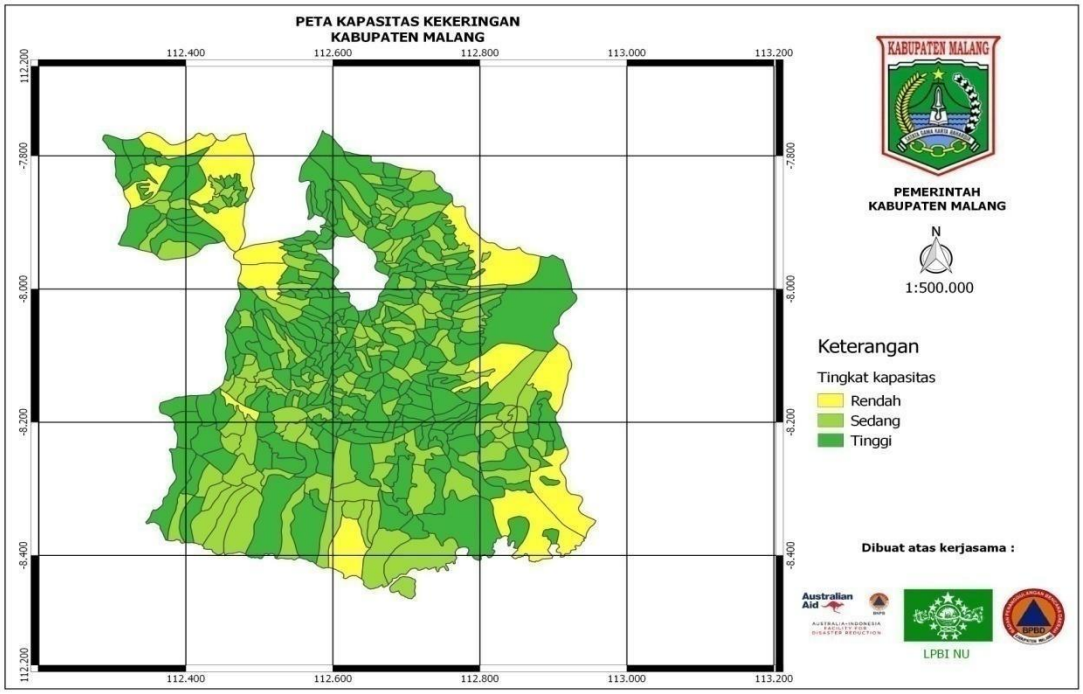


Gambar 11.3 Peta Kapasitas Kebakaran Hutan dan Lahan Kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

5. Kekeringan

Kapasitas bencana kekeringan di Kabupaten Malang pada umumnya tingkatan tinggi dan sedang. terlihat pada gambar **11.4** tingkatan rendah hanya sebagian kecil.



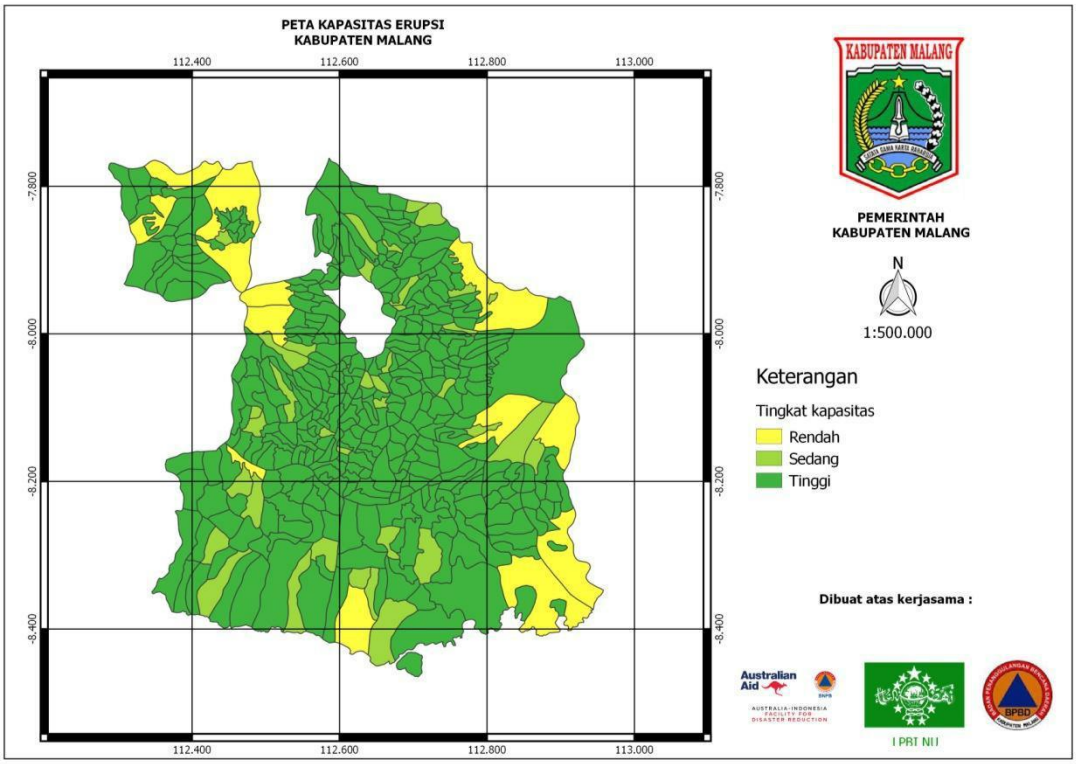
Gambar 11.4 Peta Kapasitas Kekeringan Kabupaten Malang (*Sumber: Hasil Pemetaan , 2015)*

6. Epidemi dan Wabah Penyakit

Tingkat kapasitas untuk bencana epidemi dan wabah penyakit di Kabupaten Malang digolongkan ke dalam 2 tingkatan, yaitu sedang dan rendah.

7. Erupsi Gunung Berapi

Kapasitas bencana gunung api di Kabupaten Malang terbagi atas 2 tingkatan yaitu sedang dan tinggi. Kecamatan dengan tingkat Kapasitas sedang ada di Kecamatan, Wajak, Pujon, Sementara daerah dengan tingkat kapasitas rendah berada di Kecamatan Jabung, Kasembon, dan Pujon, daerah lainya Tinggi dan bukan wilayah KRB.

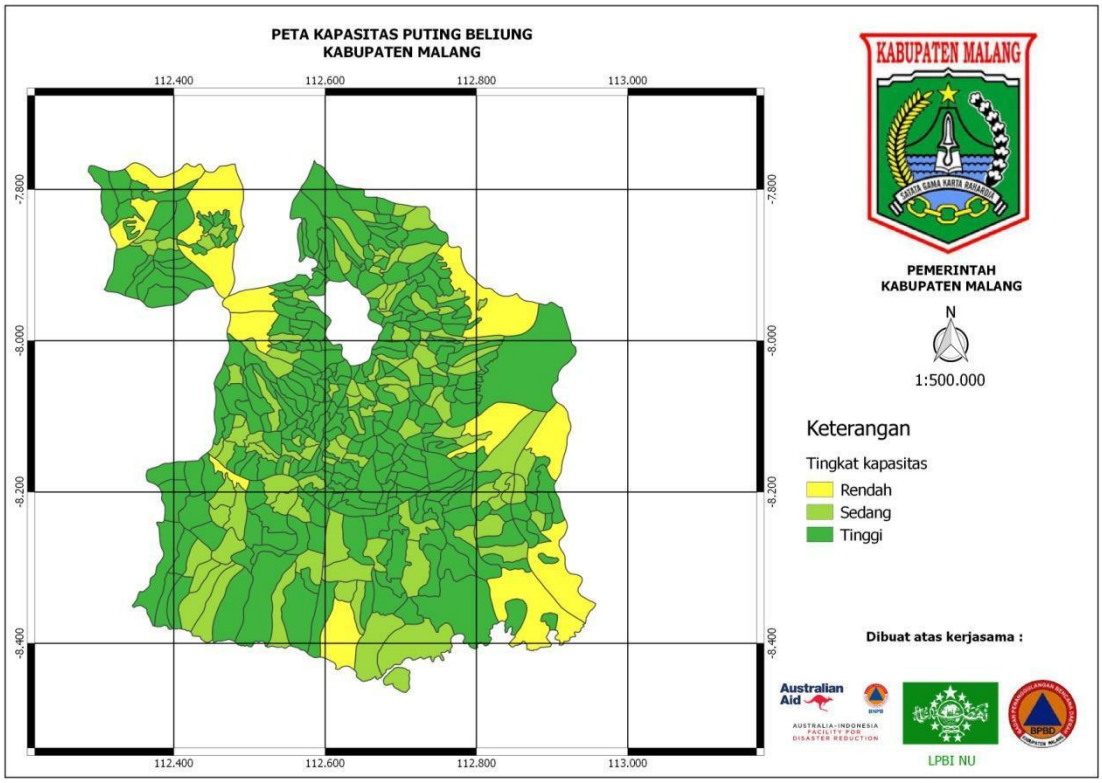


Gambar 11.5 Peta Kapasitas Erupsi Gunung Api Kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

8. Cuaca Ekstrem dan Puting Beliung

Untuk bencana Cuaca Ekstrim lebih dikaji pada bencana puting beliung, tingkat kapasitas bencana ini wilayah Kabupaten Malang secara umum dikategorikan ke dalam 2 tingkatan yaitu sedang dan tinggi. Kecamatan yang memiliki tingkat kapasitas sedang terkonsentrasi di Donomulyo, Sumbermanjing Wetan, Bantur, Wajak, Kalipare, dan Pagak. Sedangkan Kecamatan yang memiliki tingkat tinggi rendah hanya ada di beberapa Kecamatan.

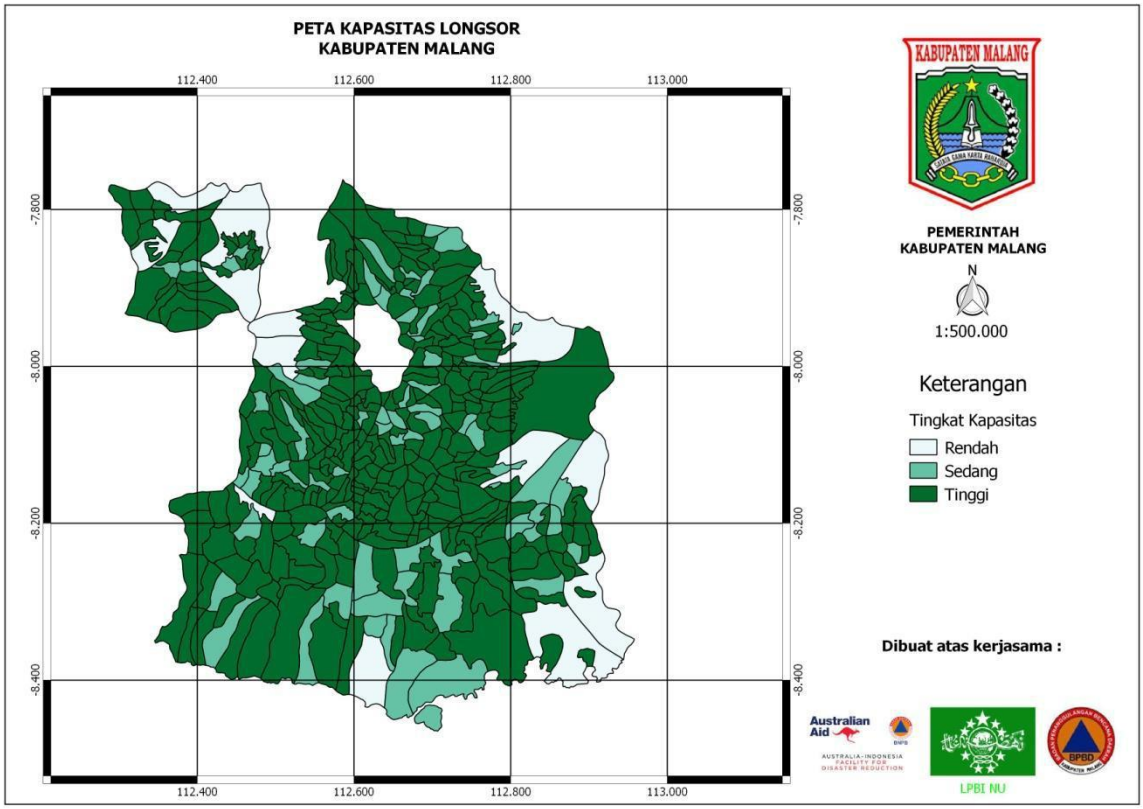


Gambar 11.6 Peta Kapasitas Puting Beliung Kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

9. Tanah Longsor

Kapasitas bencana longsor di Kabupaten Malang terbagi atas 3 tingkatan yaitu rendah, sedang dan tinggi. Tingkat Kapasitas Tinggi hampir di seluruh Kecamatan dan Tingkat Kpasitas sedang ada di Kecamatan Donomulyo, Sumbermanjing Wetan, Wajak, dan Bantur.

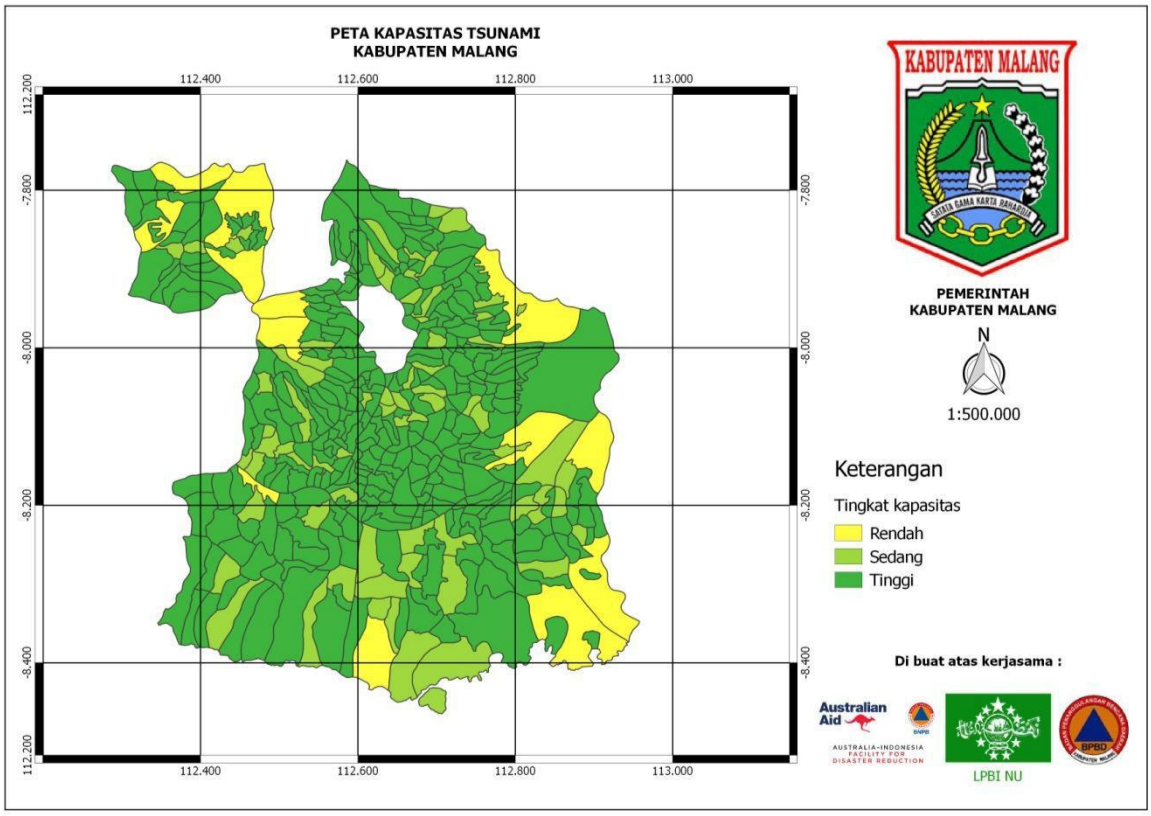


Gambar 11.7 Peta Kapasitas Longsor Kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

10. Tsunami

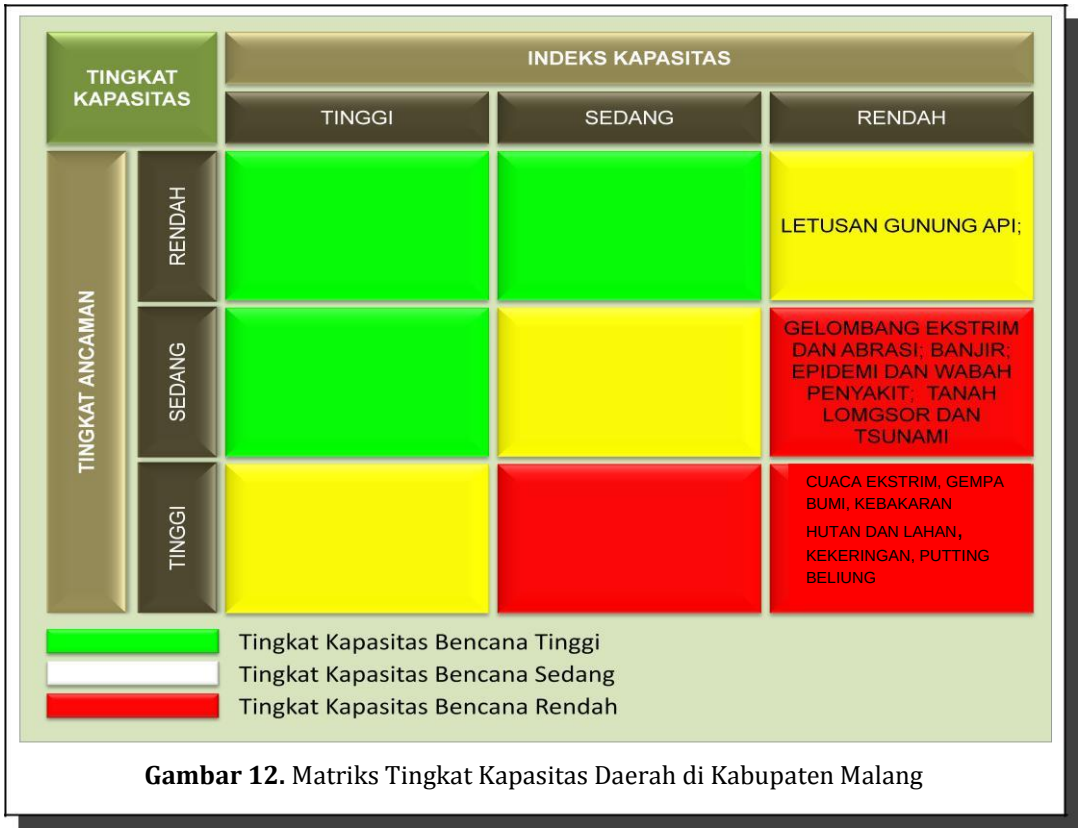
Kapasitas bencana tsunami di Kabupaten Malang terbagi atas 2 tingkatan yaitu sedang dan tinggi. Daerah dengan tingkat risiko tinggi ada wilayah pesisir pantai selatan yang meliputi kecamatan, Sumbermaning Wetan, Gedangan, Bantur, dan Donomulyo. Daerah dengan tingkat kapasitas sedang meliputi Kecamatan Tirtoyudo, dan Ampel Gading Sedangkan kecamatan lainnya tidak terdampak/terancam bencana Tsunami.



Gambar 11.8 Peta Kapasitas Tsunami Kabupaten Malang

(*Sumber: Hasil Pemetaan , 2015)*

Kajian kapasitas ini juga didapatkan melalui pemetaan komponen ketahanan daerah dan komponen kesiapsiagaan daerah. Komponen ketahanan daerah didapatkan dari *Focus Group Discusion* (FGD*)* dengan pemangku kebijakan di tingkat pemerintahan, sedangkan komponen kesiapsiagaan daerah di dapatkan dari survey intensif terhadap komunitas masyarakat dan komunitas sekolah di Kabupaten Malang, Hasil analisis umum tingkat kapasitas daerah untuk Kabupaten Malang. dapat dilihat pada **Gambar 12**.



Gambar 12. Matriks Tingkat Kapasitas Daerah di Kabupaten Malang

Berdasarkan Matriks Tingkat Kapasitas Bencana Kabupaten Malang di atas dapat disimpulkan bahwa di seluruh wilayah Kabupaten Malang untuk bencana letusan gunung api adalah **SEDANG**, dengan tingkat ancaman rendah dan indek kapasitas tinggi. Sedangkan bencana gelombang ekstrim dan abrasi, banjir, epidemi dan wabah penyakit, tanah longsor dan tsunami memiliki tingkat kapasitas **RENDAH** dengan indeks ancaman sedang dan indeks kapasitas rendah. Bencana cuaca ekstrim, puting beliung gempa bumi, kebakaran hutan dan lahan serta kekeringan memiliki tingkat kapasitas **RENDAH,** dengan indeks ancaman tinggi dan indeks kapasitas rendah.

Penjabaran komponen-komponen yang digunakan untuk mendapatkan indeks kapasitas daerah adalah sebagai berikut:

1. Prioritas dan Indikator Penghitungan Tingkat Kapasitas Daerah

- **Komponen Ketahanan Daerah**

  HFA yang disepakati oleh lebih dari 160 negara di dunia terdiri dari 5 Prioritas program Pengurangan Risiko Bencana. Pencapaian prioritas-prioritas pengurangan risiko bencana ini diukur dengan 22 indikator pencapaian. Prioritas program pengurangan risiko bencana HFA dan indikator pencapaiannya adalah:

  a. **Memastikan bahwa pengurangan risiko bencana menjadi sebuah prioritas nasional dan lokal dengan dasar kelembagaan yang kuat untuk pelaksanaannya**, dengan indikator pencapaian:

     1) kerangka hukum dan kebijakan nasional/lokal untuk pengurangan risiko bencana telah ada dengan tanggung jawab eksplisit ditetapkan untuk semua jenjang pemerintahan;

     2) tersedianya sumber daya yang dialokasikan khusus untuk kegiatan pengurangan risiko bencana di semua tingkat pemerintahan;

     3) terjalinnya partisipasi dan desentralisasi komunitas melalui pembagian kewenangan dan sumber daya pada tingkat lokal; dan

     4) berfungsinya forum/jaringan daerah khusus untuk pengurangan risiko bencana.

  b. **Mengidentifikasi, mengkaji dan memantau risiko bencana dan meningkatkan peringatan dini**, dengan indikator pencapaian:

     1) tersedianya Kajian Risiko Bencana daerah berdasarkan data bahaya dan kerentanan untuk meliputi risiko untuk sektor-sektor utama daerah;

     2) tersedianya sistem-sistem yang siap untuk memantau, mengarsip dan menyebarluaskan data potensi bencana dan kerentanan-kerentanan utama;

     3) tersedianya sistem peringatan dini yang siap beroperasi untuk skala besar dengan jangkauan yang luas ke seluruh lapisan masyarakat; dan

4) kajian risiko daerah mempertimbangkan risiko-risiko lintas batas guna menggalang kerjasama antar daerah untuk pengurangan risiko.

c. **Menggunakan pengetahuan, inovasi, dan pendidikan untuk membangun suatu budaya keselamatan dan ketahanan di semua tingkat**, dengan indikator pencapaian:

1) tersedianya informasi yang relevan mengenai bencana dan dapat diakses di semua tingkat oleh seluruh pemangku kepentingan (melalui jejaring, pengembangan sistem untuk berbagi informasi, dst);

2) kurikulum sekolah, materi pendidikan dan pelatihan yang relevan mencakup konsep-konsep dan praktik-praktik mengenai pengurangan risiko bencana dan pemulihan;

3) tersedianya metode riset untuk kajian risiko multi bencana serta analisis manfaat biaya *(cost benefit analysist)* yang selalu dikembangkan berdasarkan kualitas hasil riset; dan

4) diterapkannya strategi untuk membangun kesadaran seluruh komunitas dalam melaksanakan praktik budaya tahan bencana yang mampu menjangkau masyarakat secara luas baik di perkotaan maupun pedesaan.

d. **Mengurangi faktor-faktor risiko yang mendasar**, dengan indikator:

1) pengurangan risiko bencana merupakan salah satu tujuan dari kebijakan-kebijakan dan rencana-rencana yang berhubungan dengan lingkungan hidup, termasuk untuk pengelolaan sumber daya alam, tata guna lahan dan adaptasi terhadap perubahan iklim;

2) rencana-rencana dan kebijakan-kebijakan pembangunan sosial dilaksanakan untuk mengurangi kerentanan penduduk yang paling berisiko terkena dampak bencana;

3) rencana-rencana dan kebijakan-kebijakan sektoral di bidang ekonomi dan produksi telah dilaksanakan untuk mengurangi kerentanan kegiatan-kegiatan ekonomi;

4) perencanaan dan pengelolaan pemukiman manusia memuat unsur-unsur pengurangan risiko bencana termasuk pemberlakuan syarat dan

izin mendirikan bangunan untuk keselamatan dan kesehatan umum *(enforcement of building codes)*;

5) langkah-langkah pengurangan risiko bencana dipadukan ke dalam proses-proses rehabilitasi dan pemulihan pascabencana; dan

6) siap sedianya prosedur-prosedur untuk menilai dampak-dampak risiko bencana atau proyek-proyek pembangunan besar, terutama infrastruktur.

e. Memperkuat kesiapsiagaan terhadap bencana demi respon yang efektif di semua tingkat, dengan indikator:

1) tersedianya kebijakan, kapasitas teknis kelembagaan serta mekanisme penanganan darurat bencana yang kuat dengan perspektif pengurangan risiko bencana dalam pelaksanaannya;

2) tersedianya rencana kontinjensi bencana yang berpotensi terjadi yang siap di semua jenjang pemerintahan, latihan reguler diadakan untuk menguji dan mengembangkan program-program tanggap darurat bencana;

3) tersedianya cadangan finansial dan logistik serta mekanisme antisipasi yang siap untuk mendukung upaya penanganan darurat yang efektif dan pemulihan pascabencana; dan

4) tersedianya prosedur yang relevan untuk melakukan tinjauan pasca bencana terhadap pertukaran informasi yang relevan selama masa tanggap darurat.

Berdasarkan pengukuran indikator pencapaian ketahanan daerah maka kita dapat membagi tingkat tersebut kedalam 5 tingkatan berikut.

- **Level 1** Daerah telah memiliki pencapaian-pencapaian kecil dalam upaya pengurangan risiko bencana dengan melaksanakan beberapa tindakan maju dalam rencana-rencana atau kebijakan.
- **Level 2** Daerah telah melaksanakan beberapa tindakan pengurangan risiko bencana dengan pencapaian-pencapaian yang masih bersifat sporadis yang disebabkan belum adanya komitmen kelembagaan dan/atau kebijakan sistematis.

- **Level 3** Komitmen pemerintah dan beberapa komunitas tekait pengurangan risiko bencana di suatu daerah telah tercapai dan didukung dengan kebijakan sistematis, namun capaian yang diperoleh dengan komitmen dan kebijakan tersebut dinilai belum menyeluruh hingga masih belum cukup berarti untuk mengurangi dampak negatif dari bencana.
- **Level 4** Dengan dukungan komitmen serta kebijakan yang menyeluruh dalam pengurangan risiko bencana disuatu daerah telah memperoleh capaian-capaian yang berhasil, namun diakui masih ada keterbatasan dalam komitmen, sumber daya finansial ataupun kapasitas operasional dalam pelaksanaan upaya pengurangan risiko bencana di daerah tersebut.
- **Level 5** Capaian komprehensif telah dicapai dengan komitmen dan kapasitas yang memadai disemua tingkat komunitas dan jenjang pemerintahan.

➢ **Komponen Kesiapsiagaan Daerah**

Secara umum, komponen kesiapsiagaan daerah dalam menghadapi bencana bertujuan untuk menilai tingkat kesiapsiagaan masyarakat dalam mengantisipasi bencana, sedangkan tujuan khusus kajian kesiapsiagaan masyarakat dalam menghadapi ancaman bencana adalah sebagai salah satu komponen yang digunakan untuk meningkatkan kapasitas masyarakat. Selain itu, tujuan khusus kajian kesiapsiagaan masyarakat dalam menghadapi ancaman bencana juga sebagai acuan dalam menurunkan kerentanan masyarakat dan sebagai acuan bagi masyarakat, sekolah, dan pemerintah daerah dalam menyusun kebijakan untuk penyusunan rencana penanggulangan bencana.

Kajian kesiapsiagaan masyarakat dalam menghadapi bencana disusun dengan mengacu pada framework kesiapsiagaan yang dikembangkan oleh Lembaga Ilmu Pengetahuan Indonesia (LIPI)-UNESCO/ISDR pada tahun 2006. Parameter yang digunakan untuk mengukur tingkat kesiapsiagaan masyarakat dalam menghadapi bencana adalah sebagai berikut.

a. Pengetahuan tentang Bencana (PB), pemahaman tentang bencana alam, pemahaman tentang kerentanan lingkungan, dan pemahaman tentang kerentanan bangunan fisik dan fasilitas-fasilitas penting untuk keadaan darurat bencana.

b. Kebijakan Kesiapsiagaan Bencana (KKB), pengelola bencana, rencana aksi untuk tanggap darurat, pendidikan, panduan-panduan yang relevan, serta peraturan-peraturan yang relevan, seperti: perdes dan SK

c. Rencana Tanggap Darurat (RTD), organisasi pengelola, rencana evakuasi, rencana pertolongan korban, rencana Kebutuhan dasar, latihan/simulasi

d. Peringatan Dini Bencana (PDB), Sistem peringatan dini yang ada, tanda peringatan alam, tanda peringatan bencana berbasis teknologi

e. Mobilisasi Sumberdaya (MS), sumber daya manusia, pendanaan dan logistik, jaringan sosial, peralatan dan perlengkapan.

Parameter kesiapsiagaan di atas akan menentukan indeks prioritas dan selanjutnya dapat ditentukan tingkat kesiapsiagaan masyarakat. Penentuan nilai indeks kesiapsiagaan adalah: (a) level TINGGI, apabila total nilai indeks kesiapsiagaannya 80–100, (b) level SEDANG, apabila total nilai indeks kesiapsiagaannya 60–79, dan (c) level RENDAH, apabila total nilai indeks kesiapsiagaannya <60.

2. Indeks Tingkat Kapasitas Daerah

➢ **Komponen Ketahanan Daerah Berdasarkan Kajian Hyogo Frameworks for Actions (HFA)**

Hasil pemetaan kajian tingkat ketahanan Kabupaten Malang dalam menghadapi ancaman bencana yang mungkin terjadi berada pada **Level 3** (Total Nilai Prioritas = 58) seperti yang dapat dilihat pada **Tabel 5** di bawah ini.

Tabel 5 . Has il Kajian Ko m ponen Ketahanan Kab upaten Mala ng Berdas ark an HFA

NO	PRIORITAS	TOTAL NILAI PRIORITAS	INDEKS PRIORITAS
1	Memastikan bahwa pengurangan risiko bencana menjadi sebuah prioritas nasional dan lokal dengan dasar kelembagaan yang kuat untuk pelaksanaannya	71,25	4
2	Mengidentifikasi, mengkaji dan memantau risiko bencana dan meningkatkan peringatan dini	32,5	1
3	Menggunakan pengetahuan, inovasi dan pendidikan untuk membangun suatu budaya keselamatan dan ketahanan disemua tingkat	60	3

NO	PRIORITAS	TOTAL NILAI PRIORITAS	INDEKS PRIORITAS
4	Mengurangi faktor-faktor risiko yang mendasar	65	3
5	Memperkuat kesiapsiagaan terhadap bencana demi respon yang efektif di semua tingkat	61,25	3
TOTAL NILAI PRIORITAS		58	
INDEKS KETAHANAN DAERAH		**3**	

Tabel 5 memperlihatkan bahwa wilayah administrasi Kabupaten Malang berada pada **Level 3.** Hal ini berarti bahwa komitmen pemerintah dan beberapa komunitas terkait pengurangan risiko bencana di daerah telah tercapai dan didukung dengan kebijakan sistematis, namun capaian yang diperoleh dengan komitmen dan kebijakan tersebut dinilai belum menyeluruh hingga masih belum cukup berarti untuk mengurangi dampak negatif dari bencana.

➢ **Komponen Kesiapsiagaan Berdasarkan Kajian Kesiapsiagaan Masyarakat**

Nilai indeks kesiapsiagaan Kabupaten Malang diperoleh dari nilai indeks rata-rata tingkat kesiapsiagaan masyarakat dengan menggunakan framework yang dikembangkan oleh LIPI-UNESCO/ISDR. Berdasarkan hasil pemetaan kajian kesiapsiagaan tersebut, terlihat bahwa Komponen Ketahanan daeah berdasarkan kesiapsiagaan masyarakat di Kabupaten Malang dalam menghadapi bencana yang mungkin terjadi adalah RENDAH seperti yang dapat dilihat pada **Tabel 6**.

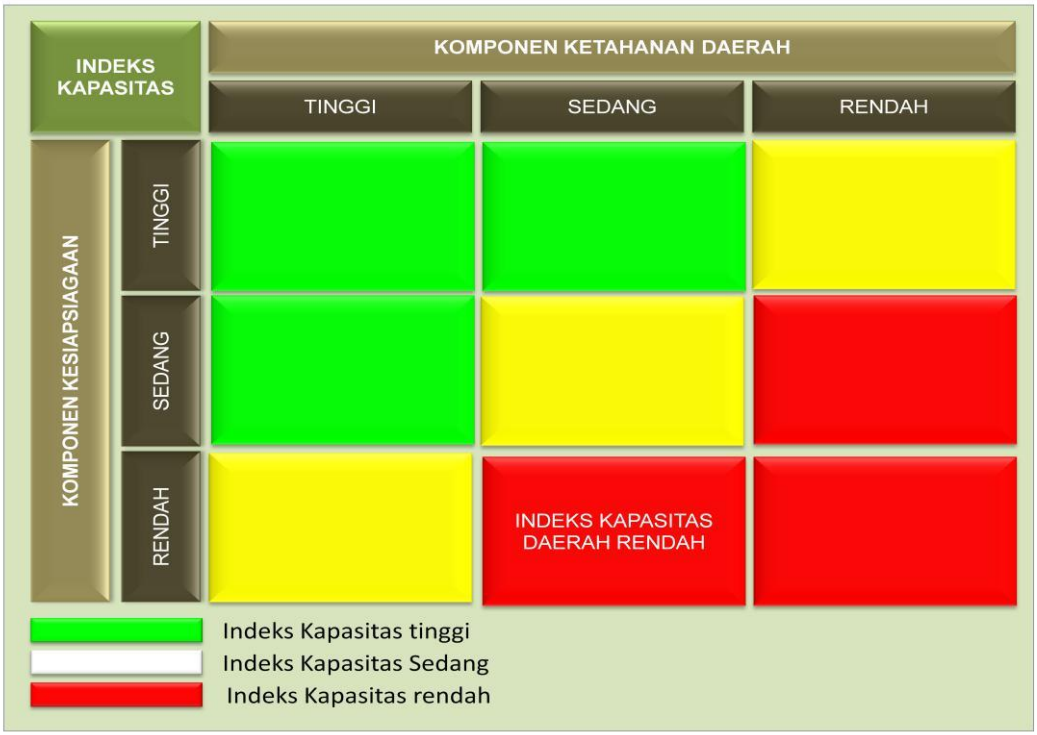
Tabel 6 . Has il Kajian Ke s iaps iagaan Kabupaten Malang

KESIAPSIAGAAN	Indeks PB	Indeks KKB	Indeks RTD	Indeks PDB	Indeks MS	Total Indeks	LEVEL
RUMAH TANGGA	18,53	2,87	2,71	5,72	3,97	33,80	RENDAH
KOMUNITAS SEKOLAH	17,24	2,88	4,01	0,96	0,92	26,02	RENDAH
KABUPATEN MALANG	18,02	2,88	3,23	3,82	2,75	30,69	RENDAH

Secara umum **Tabel 6** menjelaskan bahwa rata-rata tingkat kesiapsiagaan Kabupaten Malang **RENDAH** karena Total Indek Rumah Tangga adalah 33,80. Total Indeks Komunitas Sekolah adalah 26,02, dan Indeks Kabupaten Lebak adalah 30,69. Total Indeks tersebut merupakan penambahan dari Indek PB (Pengetahuan Bencana), Indek KKB (Kebijakan Kesiapsiagaan Bencana), Indeks RTD (Rencana Tanggap Darurat), Indeks PDB (Peringatan Dini

Bencana), dan Indeks MS (Mobilisasi Sumberdaya). Jadi, tingkat ketahanan rumah tangga, komunitas sekolah serta tingkat ketahanan Kabupaten Malang berada pada level rendah dalam pencapaian upaya pengurangan risiko bencana karena memiliki skala kecil dari 60.

Indeks kapasitas Kabupaten Malang dikaji berdasarkan komponen ketahanan daerah (HFA) dan komponen kesiapsiagaan dapat dilihat pada **Gambar 13.**



Gambar 13. Matriks Indeks Kapasitas Daerah di Kabupaten Malang

Berdasarkan matrik indeks kapasitas di atas terlihat bahwa komponen kesiapsiagaan Kabupaten Malang berada pada level rendah dan komponen ketahanan daerah sedang. Hal ini menyebabkan indeks kapasitas Kabupaten Lebak menjadi **RENDAH**, sehingga dibutuhkan beberapa perubahan yang harus dilakukan pemerintah Kabupaten Malang agar komponen kesiapsiagaan dan komponen ketahanan daerah menjadi meningkat.

3. Analisis Indeks Kapasitas Daerah

Komponen Ketahanan Daerah

a. Memastikan bahwa pengurangan risiko bencana menjadi sebuah prioritas nasional dan lokal dengan dasar kelembagaan yang kuat untuk pelaksanaannya.

Perubahan paradigma internasional dan nasional dalam penyelenggaraan penanggulangan bencana ke arah yang lebih terfokus pada fase sebelum terjadi bencana melalui upaya-upaya pengurangan risiko mendorong Pemerintah Kabupaten Malang untuk melakukan upaya-upaya pengarusutamaan Pengurangan Risiko Bencana meskipun belum secara menyeluruh. Praktik-praktik pengurangan risiko bencana telah mulai dilakukan dengan menjalin partisipasi dan desentralisasi komunitas melalui pembagian kewenangan dan sumber daya pada tingkat lokal dengan cara membangun akses media lokal terhadap publikasi upaya-upaya penanggulangan bencana daerah secara transparan.

Peran komunitas terhadap pengarusutamaan Pengurangan Risiko Bencana dalam pembangunan berkelanjutan telah dilakukan melalui diskusi-diskusi formal maupun informal antar pelaku penanggulangan bencana di Kabupaten Malang. Proses diskusi yang telah berjalan ini perlu ditindaklanjuti menjadi sebuah forum resmi yang diakui oleh pemerintah. Forum ini bisa menjadi mitra kerja strategis pemerintah dalam menyusun arah kebijakan dan strategi penyelenggaraan penanggulangan bencana di Kabupaten Malang. Forum ini diharapkan dapat mempercepat upaya-upaya pengurangan risiko bencana secara menyeluruh di Kabupaten Malang.

b. Mengidentifikasi, mengkaji dan memantau risiko bencana dan meningkatkan peringatan dini.

Pelaksanaan Kajian Risiko Bencana membutuhkan data yang akurat. Pemerintah Kabupaten Malang perlu membangun sistem-sistem yang siap untuk memantau, mengarsipkan dan menyebarluaskan data potensi bencana dan kerentanan utama terkait proses analisis risiko. Proses pengarsipan dan penyediaan data-data kebencanaan telah mulai dilakukan oleh Pemerintah Kabupaten Malang melalui jajaran institusinya, namun hal ini masih perlu diperkuat dengan membangun sebuah sistem informasi, diseminasi dan

publikasi kebencanaan sehingga memungkinkan untuk diakses oleh komunitas di dalam daerah maupun komunitas di luar daerah. Sistem informasi kebencanaan yang dibangun ini sebaiknya juga terintegrasi dan tersinkronisasi dengan sistem informasi kebencanaan yang ada di tingkat provinsi maupun nasional.

Di samping itu untuk daerah-daerah yang berada di wilayah batas administrasi perlu pendekatan dan penanganan dengan strategi yang berbeda. Pembangunan kesepahaman yang baik dengan daerah tetangga perlu dilakukan agar bisa ditetapkan strategi bersama terhadap penyelenggaraan penanggulangan bencana di daerah tapal batas. Proses pembangunan kesepahaman bisa dilakukan dengan melaksanakan Kajian Risiko Bencana bersama dengan memperhitungkan aspek risiko lintas batas. Hasil kajian risiko bencana ini bisa dimanfaatkan bersama-sama untuk melahirkan sebuah *grand design* penyelenggaraan penanggulangan bencana lintas batas.

c. Terwujudnya penggunaan pengetahuan, inovasi dan pendidikan untuk membangun ketahanan dan budaya aman dari bencana di semua tingkat.

Pembangunan kapasitas dan budaya aman disuatu daerah amat bergantung kepada ketersediaan data dan informasi yang telah diolah sedemikian rupa sehingga dimengerti oleh seluruh lapisan masyarakat. Oleh karena itu, penyajian data terapan yang aplikatif melalui sebuah sistem informasi yang efektif sehingga selalu dapat diakses oleh masyarakat penting untuk dilakukan.

Pembangunan budaya aman bencana bisa dilakukan melalui intervensi terhadap dunia riset dan pendidikan. Pelaksanaan riset-riset kebencanaan secara terencana dan terpadu akan memberikan alternatif-alternatif metode aplikatif dalam pengurangan risiko bencana. Pemerintah Kabupaten Malang memfokuskan pelaksanaan riset kebencanaan untuk meningkatkan efektifitas penggunaan biaya pemulihan setelah terjadi bencana. Metode pengurangan biaya pemulihan dilakukan berdasarkan riset-riset yang dilaksanakan oleh para ahli dan akademisi. Riset tersebut ditujukan tidak hanya untuk memenuhi kebutuhan internal komunitas ahli dan akademisi semata, namun harus mampu diterapkan hingga tingkat rumah tangga.

d. Mengurangi faktor-faktor risiko dasar.

Usaha-usaha pengurangan faktor-faktor risiko dasar telah mulai dilakukan oleh Kabupaten Malang melalui kebijakan-kebijakan pengelolaan lingkungan hidup maupun penataan ruang dan wilayah. Namun demikian Kabupaten Malang perlu memfokuskan upaya pengurangan faktor-faktor risiko dasar pada perkuatan sektor-sektor produksi dalam rangka mengurangi kerentanan perekonomian masyarakat, terutama terhadap usaha kecil dan menengah. Perkuatan sektor-sektor produksi masyarakat ini akan memberikan pengaruh yang besar terhadap proses pembangunan kapasitas serta pengurangan risiko bencana. Perkuatan sektor-sektor ekonomi tersebut dilakukan melalui kemitraan pemerintah dengan dunia usaha untuk membangun kemandirian ekonomi masyarakat.

e. Memperkuat kesiapsiagaan terhadap bencana demi respon yang efektif di semua tingkat.

Upaya-upaya memperkuat kesiapsiagaan bencana daerah perlu difokuskan kepada penyusunan rencana kontinjensi untuk seluruh bencana dengan tingkat risiko tinggi. Rencana Kontinjensi yang tersusun harus tersinkronisasi dengan prosedur-prosedur penanggulangan bencana yang berlaku di Kabupaten Malang. Selanjutnya, Menyediakan prosedur yang relevan untuk melakukan tinjauan pasca bencana terhadap pertukaran informasi yang relevan selama masa tanggap darurat dengan cara membangun mekanisme pengawasan dan evaluasi terhadap operasi kedaruratan berdasarkan catatan komunikasi dengan mewawancarai para tokoh terkait untuk meningkatkan efekitivitas operasi darurat di kemudian hari. Sehingga rencana kontinjensi perlu diuji coba dan dievaluasi secara teratur melalui pelaksanaan latihan-latihan kesiapsiagaan dan simulasi-simulasi penanggulangan bencana di tingkat insititusi pemerintah dan masyarakat.

Proses evaluasi juga perlu dilakukan terhadap pelaksanaan operasi tanggap darurat bencana yang telah berjalan. Mekanisme evaluasi perlu ditetapkan untuk menjamin tingkat ketepatan dalam mengidentifikasi temuan dan pembelajaran selama pelaksanaan operasi tanggap darurat bencana. Hasil evaluasi ini akan menjadi salah satu bahan acuan dalam meningkatkan efektifitas pelaksanaan operasi-operasi tanggap darurat bencana selanjutnya di kabupaten Malang.

Komponen Kesiapsiagaan Daerah

a. Pengetahuan Bencana

Pengetahuan bencana yang dimiliki komunitas masyarakat dan komunitas sekolah berada pada level rendah. Namun berdasarkan hasil kajian pemahaman pengetahuan kebencanaan di komunitas sekolah lebih rendah dibandingkan dengan komunitas masyarakat. Berdasarkan hal tersebut pemerintah Kabupaten Malang perlu memproritaskan peningkatan pengetahuan terhadap bencana di komunitas sekolah. Hal ini dapat dilakukan dengan cara melakukan sosialisasi, pengadaan kurikulum pengetahuan bencana disekolah dan pengadaan buku-buku tentang pengetahuan bencana.

b. Kebijakan Kesiapsiagaan Bencana

Kebijakan kesiapsiagaan bencana di Kabupaten Malang perlu di tingkatkan, karena berada pada level rendah baik di tingkat komunitas sekolah maupun di tingkat komunitas masyarakat. Sehingga pemerintah perlu membuat kebijakan pada komunitas tersebut, karena kebijakan dalam kesiapsiagaan terhadap bencana belum terealisasikan di Kabupaten Malang.

c. Tanggap Darurat Bencana

Upaya peningkatan rencana tanggap darurat berdasarkan hasil kajian komponen kesiapsigaan di Kabupaten Malang di prioritaskan pada komunitas masyarakat. Karena level rencana tanggap darurat pada komunitas masyarakat lebih rendah dibandingkan dengan komunitas sekolah. Hal ini dapat diwujudkan dengan pengkajian terhadap risiko bencana dan mensosialisaikannya pada komunitas masyarakat, tanpa mengabaikan komunitas sekolah.

d. Peringatan Dini Bencana

Peringatan dini bencana yang ada pada komunitas sekolah dan komunitas masyarakat di Kabupaten Malang berada pada level rendah. Sehingga dibutuhkan peningkatan pengetahuan peringatan dini bencana terutama pada komunitas sekolah. Hal ini disebabkan karena komunitas sekolah memiliki pengetahuan peringatan dini bencana rendah dibandingkan komunitas sekolah. Dengan cara sosialisasi, peningkatan kapasitas dan melakukan simulasi dengan menggunakan alat sistim peringatan dini bencana.

e. Mobilisasi Sumber Daya

Dalam menghadapi bencana di Kabupaten Malang perlu adanya peningkatan pengetahuan dalam menyediakan mobilisasi sumberdaya, hal ini dapat dilihat pada mobilisasi sumberdaya komunitas sekolah lebih rendah di bandingkan dengan komunitas masyarakat. Sehingga pemerintah perlu memprioritaskan peningkatan sumberdaya mobilisasi sekolah. Hal ini dapat diwujudkan dengan adanya sosialisasi dan simulasi (latihan penyelamatan diri) dari bencana yang mungkin terjadi atau berpotensi di kabupaten Malang.

4. Kebijakan Prioritas Penanggulangan Bencana

Kebijakan Prioritas Penanggulangan Bencana dapat diperoleh berdasarkan hasil kajian kapasitas seperti yang telah diuraikan untuk 5 prioritas HFA. Kebijakan Prioritas Penanggulangan Bencana Kabupaten Malang adalah sebagai berikut:

a. Menjalin partisipasi dan desentralisasi komunitas melalui pembagian kewenangan dan sumber daya pada tingkat lokal.

b. Membentuk dan memberdayakan forum/jaringan daerah khusus untuk pengurangan risiko bencana.

c. Menyelenggarakan sistem-sistem yang siap untuk memantau, mengarsipkan dan menyebar luas kan data potensi bencana dan kerentanan-kerentanan utama.

d. Memperkuat Dokumen Kajian Risiko Daerah, mempertimbangkan risiko-risiko lintas batas guna menggalang kerjasama antar daerah untuk pengurangan risiko.

e. Menyediakan informasi yang relevan mengenai bencana dan dapat diakses di semua tingkat oleh seluruh pemangku kepentingan (melalui jejaring, pengembangan sistem untuk berbagi informasi, dst).

f. Menerapkan metode riset untuk kajian risiko multi bencana serta analisis manfaat-biaya *(cost benefit analysist)* yang selalu dikembangkan berdasarkan kualitas hasil riset.

g. Mewujudkan rencana dan kebijakan bidang ekonomi dan produksi untuk mengurangi kerentanan perekonomian masyarakat.

h. Menyusun rencana kontinjensi bencana yang berpotensi terjadi yang siap di semua jenjang pemerintahan, latihan reguler diadakan untuk menguji dan mengembangkan program-program tanggap darurat bencana.

i. Menyediakan prosedur yang relevan untuk melakukan tinjauan pasca bencana terhadap pertukaran informasi yang relevan selama masa tanggap darurat.

F. RISIKO BENCANA

Potensi kerugian yang ditimbulkan akibat bencana pada suatu wilayah dan kurun waktu tertentu berupa kematian, luka, sakit, jiwa terancam, hilangnya rasa aman, mengungsi, kerusakan atau kehilangan harta, dan gangguan kegiatan masyarakat merupakan risiko dari sebuah bencana.

1. Tingkat Risiko Kabupaten Malang

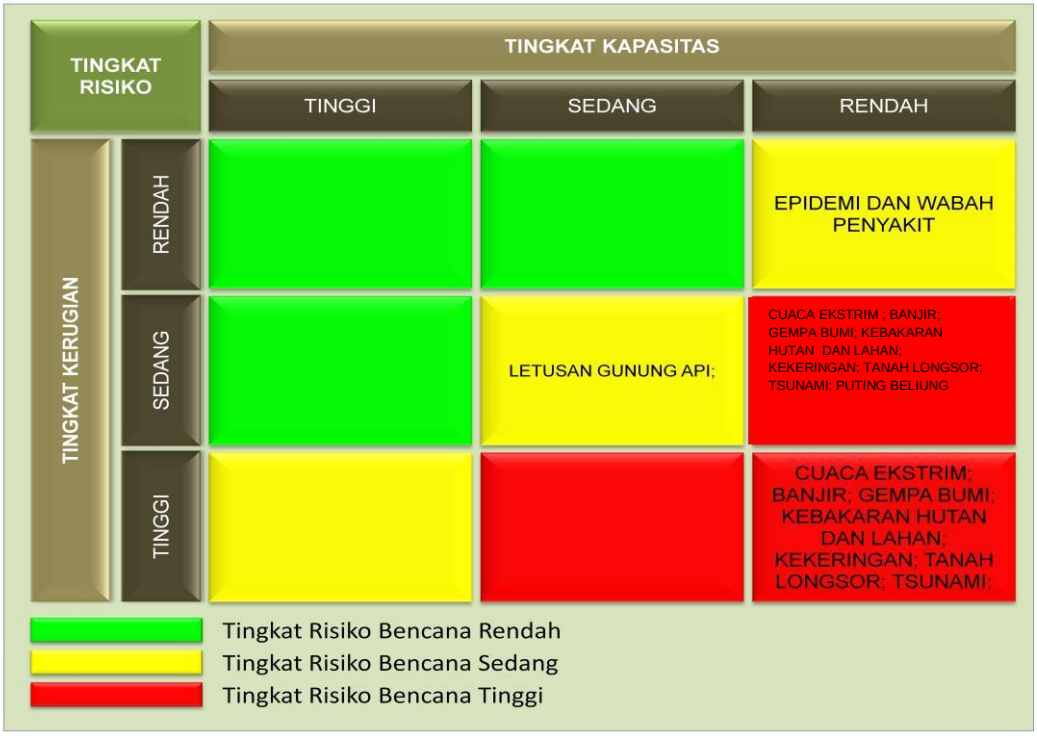
Tingkat risiko setiap jenis ancaman bencana yang berpotensi di Kabupaten Malang diperoleh berdasarkan gabungan tingkat kerugian dan tingkat kapasitas. Dari gabungan tingkat tersebut diperoleh tingkat risiko untuk setiap jenis bencana di Kabupaten Malang. Hasil dari tingkat risiko bencana pada **Tabel 7**.

Tabel 7 . Tingk at Ris ik o Benc ana di Kabupa ten Malang

NO	JENIS BENCANA	TINGKAT RISIKO
1.	BANJIR	TINGGI
2.	GELOMBANG EKSTRIM DAN ABRASI	TINGGI
3.	GEMPA BUMI	TINGGI
4.	KEBAKARAN HUTAN DAN LAHAN	TINGGI
5.	KEKERINGAN	TINGGI
6.	EPIDEMI DAN WABAH PENYAKIT	SEDANG
7.	LETUSAN GUNUNG API	SEDANG
8.	CUACA EKSTRIM DAN PUTING BELIUNG	TINGGI
9.	TANAH LONGSOR	TINGGI
10.	TSUNAMI	TINGGI

Dari **tabel 7** dapat disimpulkan indeks tingkat risiko di Kabupaten Malang yang dihitung dengan menggabungkan tingkat kerugian dengan tingkat kapasitas. Penentuan tingkat risiko bencana dilaksanakan untuk setiap ancaman bencana yang ada pada suatu daerah. Penentuan dilaksanakan dengan menghubungkan tingkat kerugian dan tingkat kapasitas dalam matriks tersebut. Warna tempat

pertemuan nilai tersebut melambangkan tingkat risiko suatu bencana di kawasan tersebut. Hasil kajian tingkat risiko bencana dengan urutan jenis bencana yang paling tinggi risikonya sampai yang terendah risikonya dapat dilihat pada **Gambar 14.**



Gambar 14. Matriks Penentuan Tingkat Risiko Bencana di Kabupaten Malang

Berdasarkan **Gambar 14** tentang Tingkat Risiko Bencana Kabupaten Malang, dapat disimpulkan sebagai berikut:

a. Tingkat risiko bencana epidemi dan wabah penyakit adalah **SEDANG,** dengan tingkat kapasitas *tinggi* dan tingkat kerugian *rendah*. Sedangkan bencana letusan gunung api, memiliki tingkat kerugian sedang dan tingkat kapasitas sedang.

b. Tingkat risiko bencana gelombang ekstrim dan abrasi adalah **TINGGI,** dengan tingkat kapasitas *rendah* dan tingkat kerugian *sedang*.

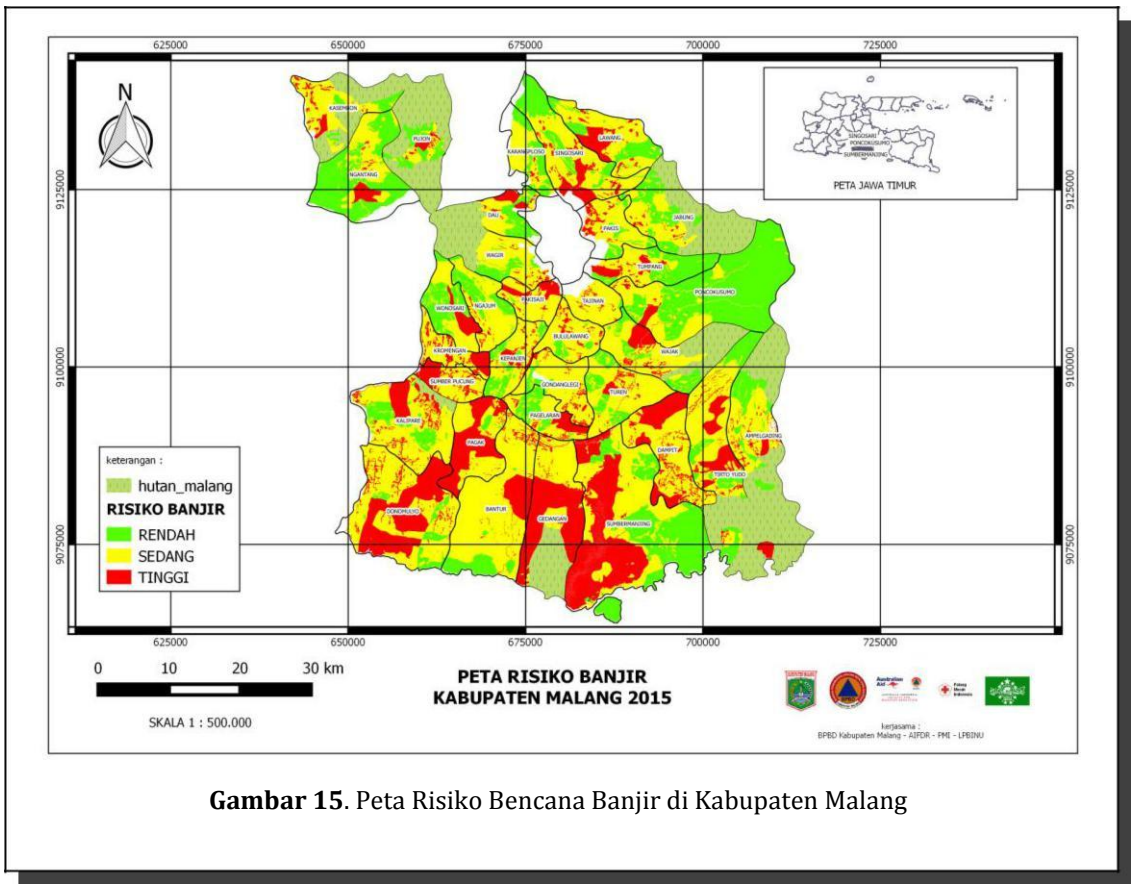
c. Tingkat risiko bencana cuaca ekstrim, banjir, gempa bumi, kebakaran hutan dan lahan, kekeringan, tanah longsor, puting beliung, dan tsunami adalah **TINGGI,** dengan tingkat kapasitas *rendah* dan tingkat kerugian *tinggi*.

2. Peta Risiko Bencana Kabupaten Malang

Penyusunan Peta Risiko Bencana dapat dilakukan dengan melakukan *overlay* Peta Ancaman, Peta Kerentanan, dan Peta Kapasitas. Peta Risiko setiap bencana yang berpotensi di Kabupaten Malang disusun untuk tiap-tiap bencana yang mengancam. Peta kerentanan baru dapat disusun setelah Peta Ancaman selesai. Peta Risiko telah dipersiapkan berdasarkan grid indeks atas Peta Ancaman, Peta Kerentanan, dan Peta Kapasitas.

2.1 Banjir

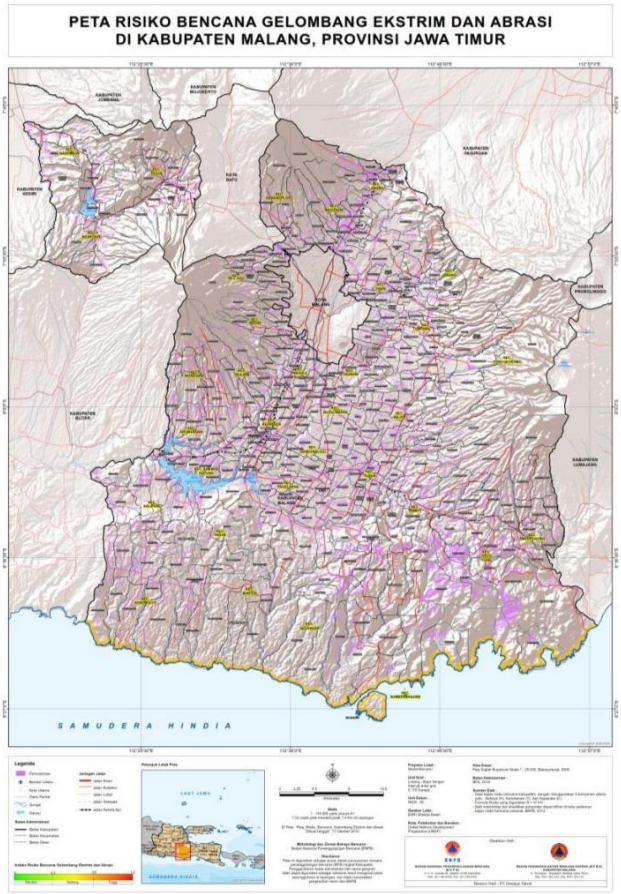
Risiko bencana banjir di Kabupaten Malang terbagi atas 3 tingkatan yaitu rendah, sedang dan tinggi. Tingkat risiko tinggi ada di wilayah Kecamatan Sumbermanjing Wetan, Gedanagan, Kalipare, dan Pagak. Sementara daerah dengan tingkat risiko sedang ada di area Kecamatan Bantur, Gondanglegi, tajinan, Bululawang Karangploso dan Wagir. dan yang ada di area rendah ada di Kecamatan Poncokusumo, dan Ngantang.



Gambar 15. Peta Risiko Bencana Banjir di Kabupaten Malang

2.2 Gelombang Ekstrim dan Abrasi

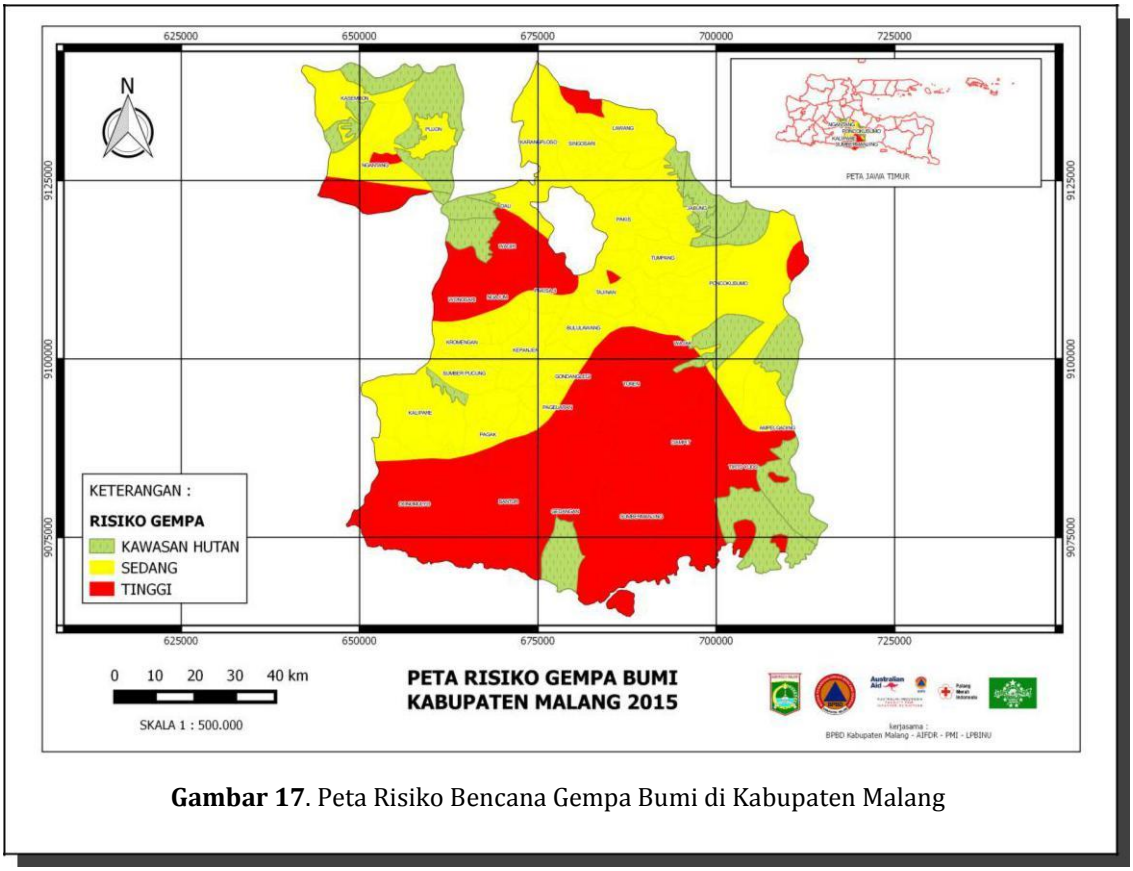
Risiko bencana gelombang ekstrim dan abrasi di Kabupaten Malang secara umum adalah tinggi mendominasi pantai selatan Malang.



Gambar 16. Peta Risiko Bencana Gelombang Ekstrim dan Abrasi di Kabupaten Malang

2.3 Gempa Bumi

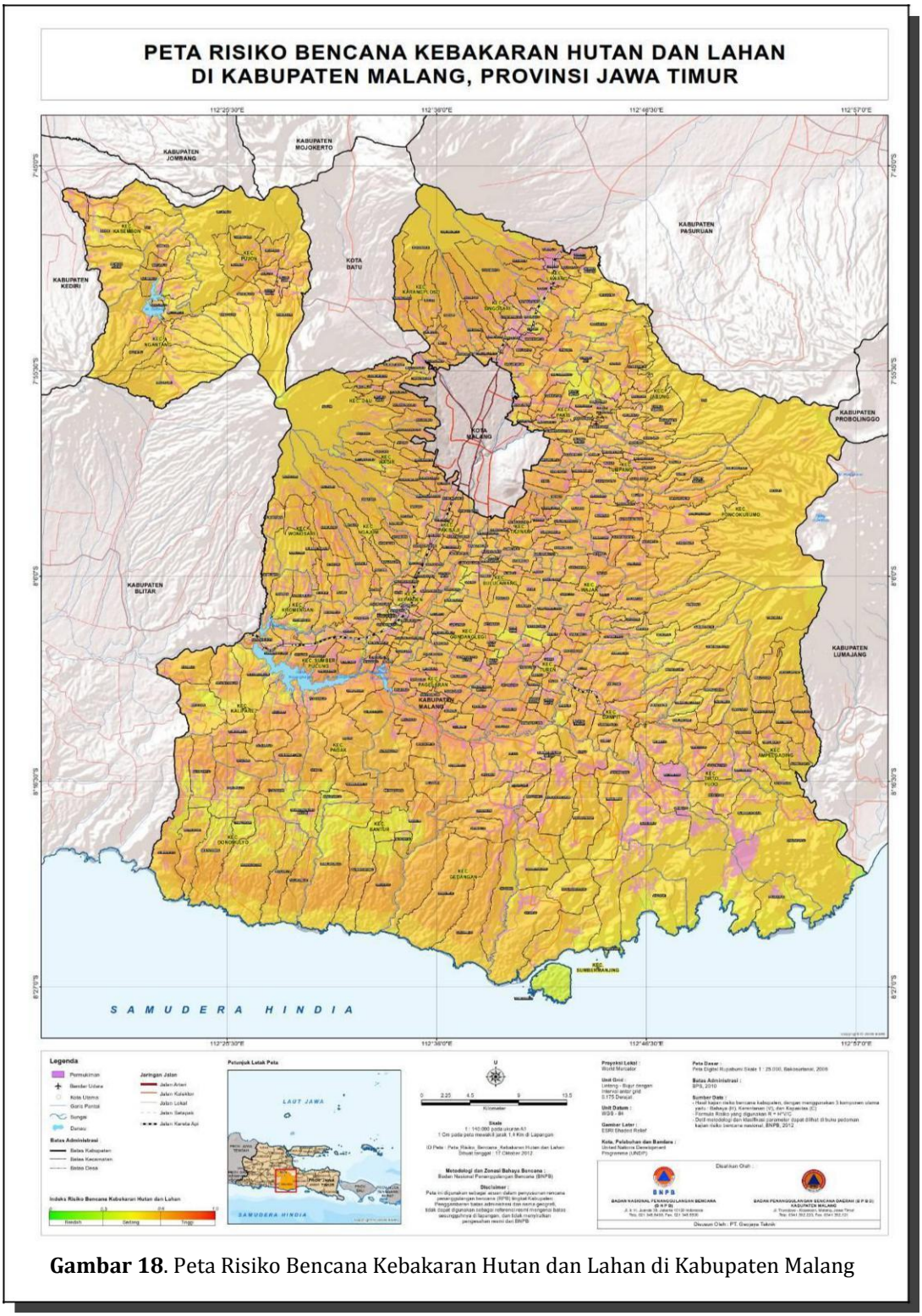
Tingkat risiko bencana gempa bumi kabupaten Malang sedang dan tinggi tersebar di seluruh wilayah kabupaten Malang . Untuk Tingkat tinggi terkonsentrasi di daerah selatan dan sebagian tengah kabupaten Malang. Sementara tingkat sedang umumnya berada di daerah tengah dan utara.



Gambar 17. Peta Risiko Bencana Gempa Bumi di Kabupaten Malang

2.4 Kebakaran Hutan dan Lahan

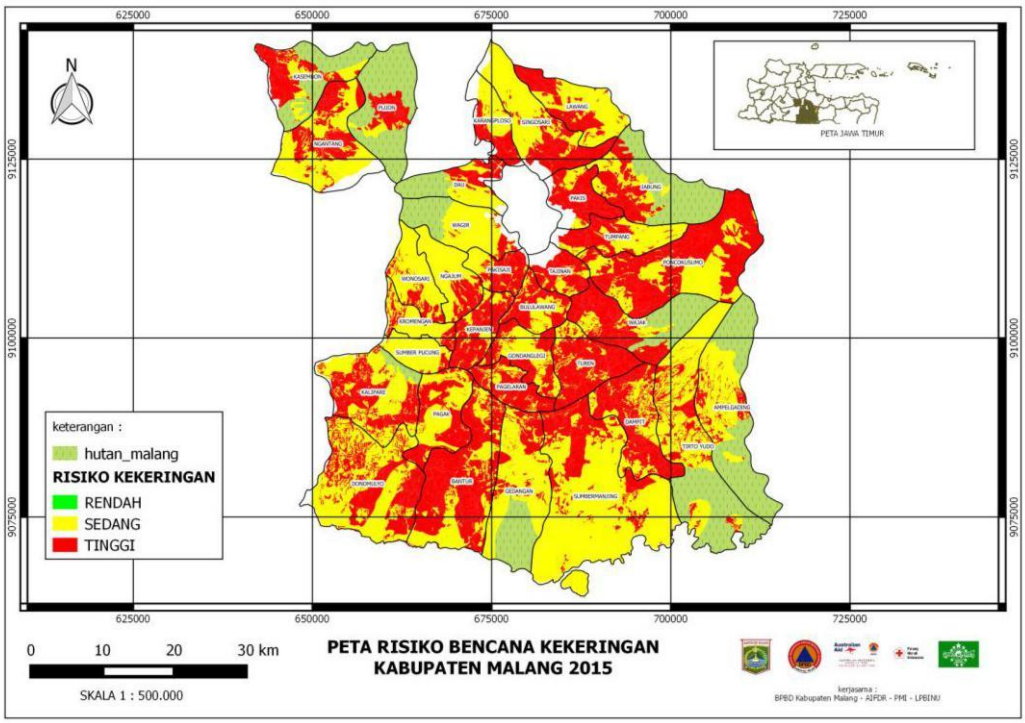
Tingkat resiko kebakaran Hutan dan Lahan di Wilayah Kabupaten Malang pada umumnya menunjukkan tingkat resiko sedang.



Gambar 18. Peta Risiko Bencana Kebakaran Hutan dan Lahan di Kabupaten Malang

2.5 Kekeringan

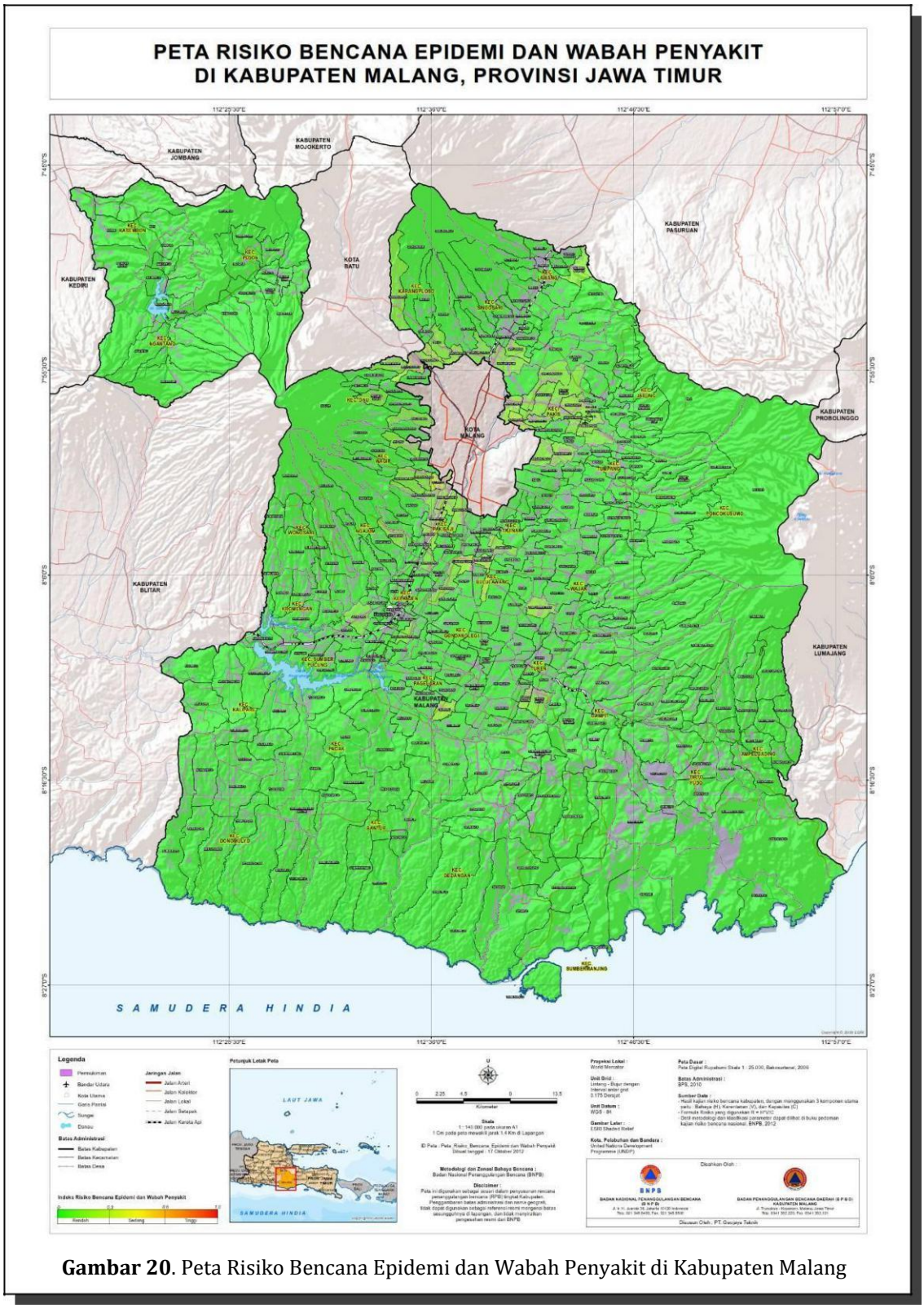
Risiko bencana kekeringan di Kabupaten Malang terbagi atas 2 tingkatan yaitu, tinggi dan sedang. Tingkat risiko tinggi ada di wilayah Kecamatan. Bantur, Pagak, Kalipare, Poncokusumo, Lawang, Singosari, Kasembon, dan Dampit, Tingkat risiko sedang terkonsentrasi di Kecamatan Sumbermanjing Wetan, Wagir, Ngajum, Wonosari.



Gambar 19. Peta Risiko Bencana Kekeringan di Kabupaten Malang

2.6 Epidemi dan Wabah Penyakit

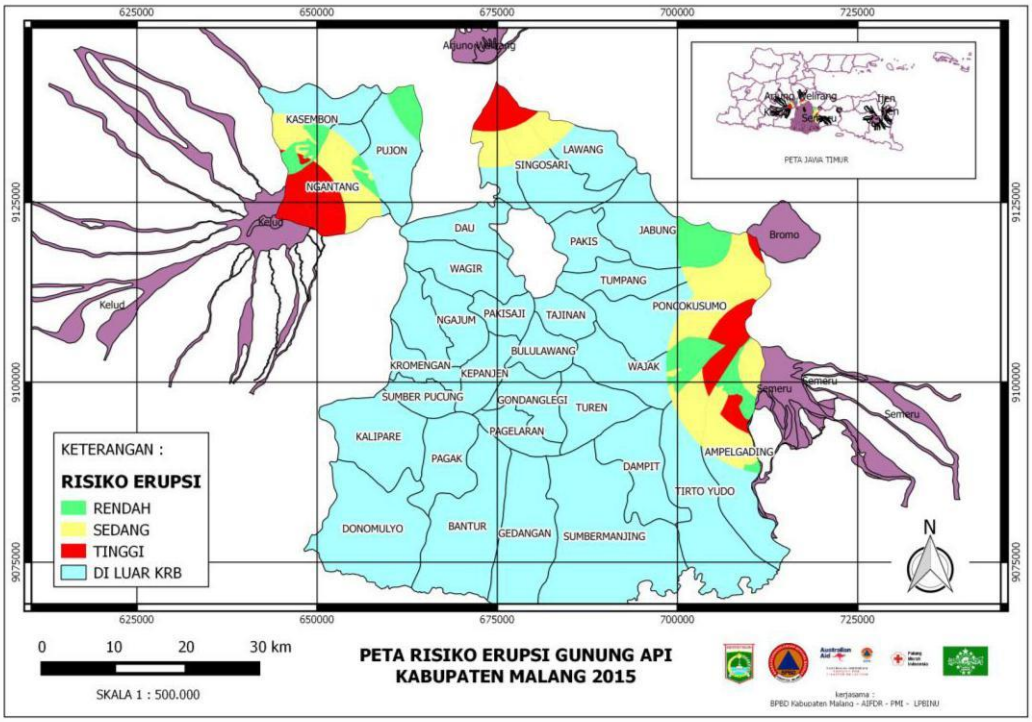
Tingkat risiko untuk bencana epidemi dan wabah penyakit di Kabupaten Malang tergolong rendah.



Gambar 20. Peta Risiko Bencana Epidemi dan Wabah Penyakit di Kabupaten Malang

2.7 Erupsi Gunung Api

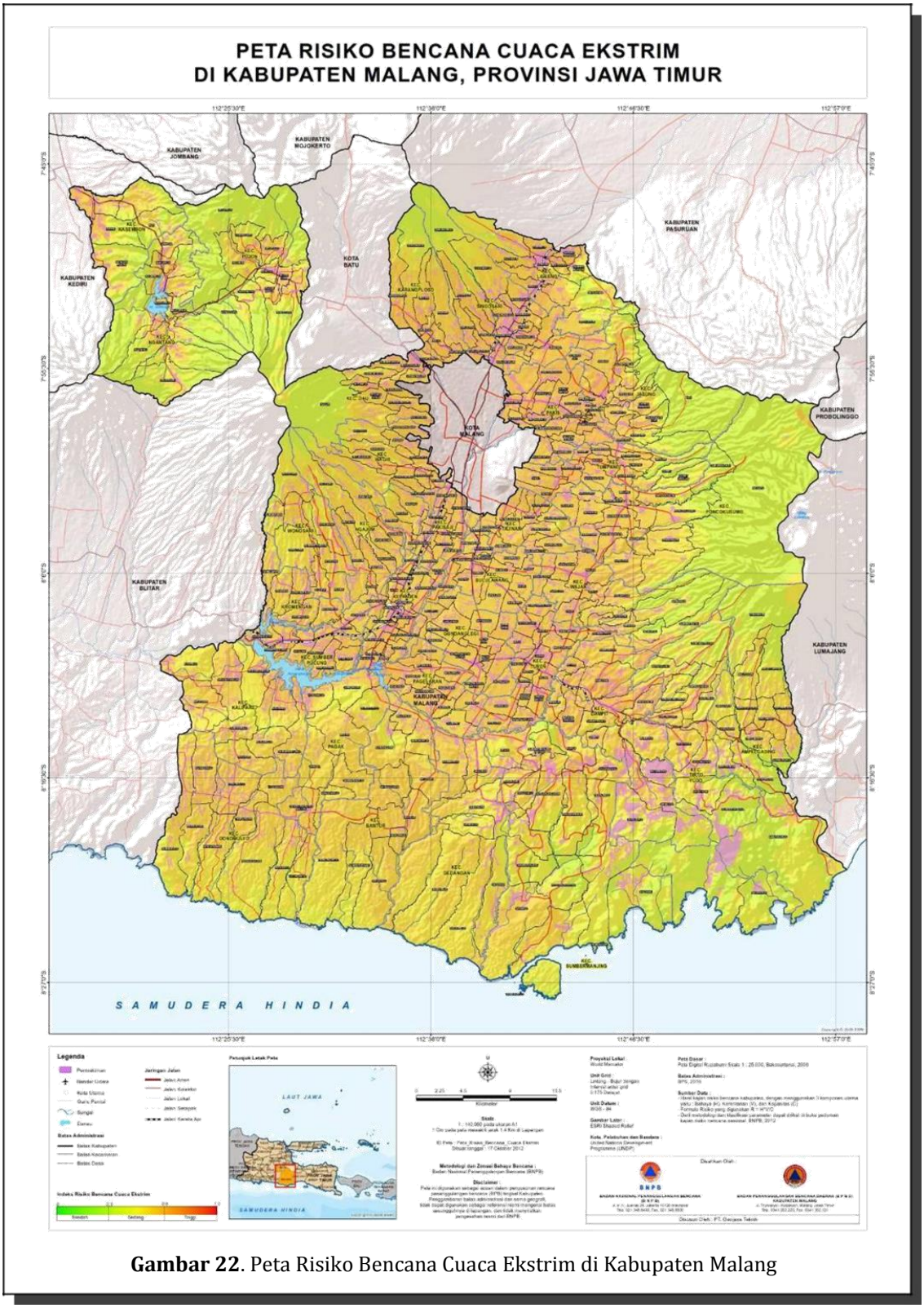
Risiko bencana gunung api di kabupaten Malang terbagi atas 2 tingkatan yaitu sedang dan tinggi. Daerah dengan tingkat risiko sedang ada di, Ampel Gading, Singosari, Lawang dan Poncokusumo sementara daerah dengan tingkat risiko Tinggi Kecamatan Kasembon, Ngantang, dan Poncokusumo.



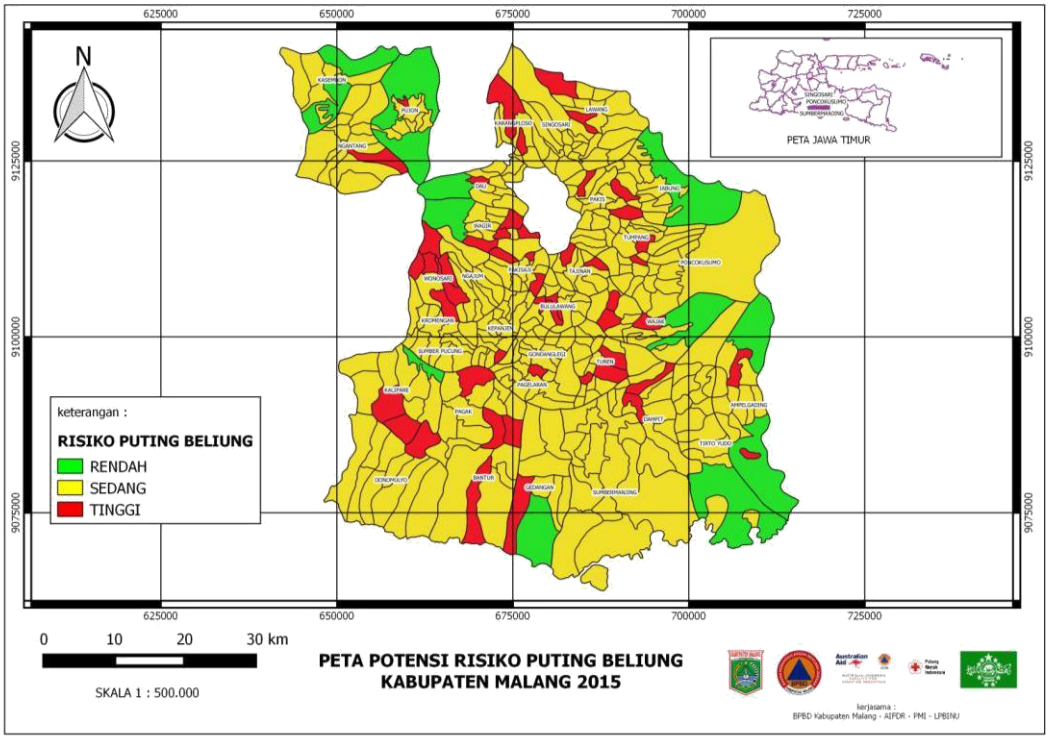
Gambar 21. Peta Risiko Bencana Erupsi di Kabupaten Malang

2.8 Cuaca Ekstrim dan Puting Beliung

Risiko bencana Cuaca Ekstrim dan Puting Beliung di Kabupaten Malang secara umum risiko adalah sedang, dan untuk Puting Beliung pada umunya juga sedang, namun ada beberapa Kecamatan yang tingkat Potensi resiko tinggi terkonsentrasi di Kecamatan Kalipare, Bantur, Karangploso, Wonosari, dan Wagir.



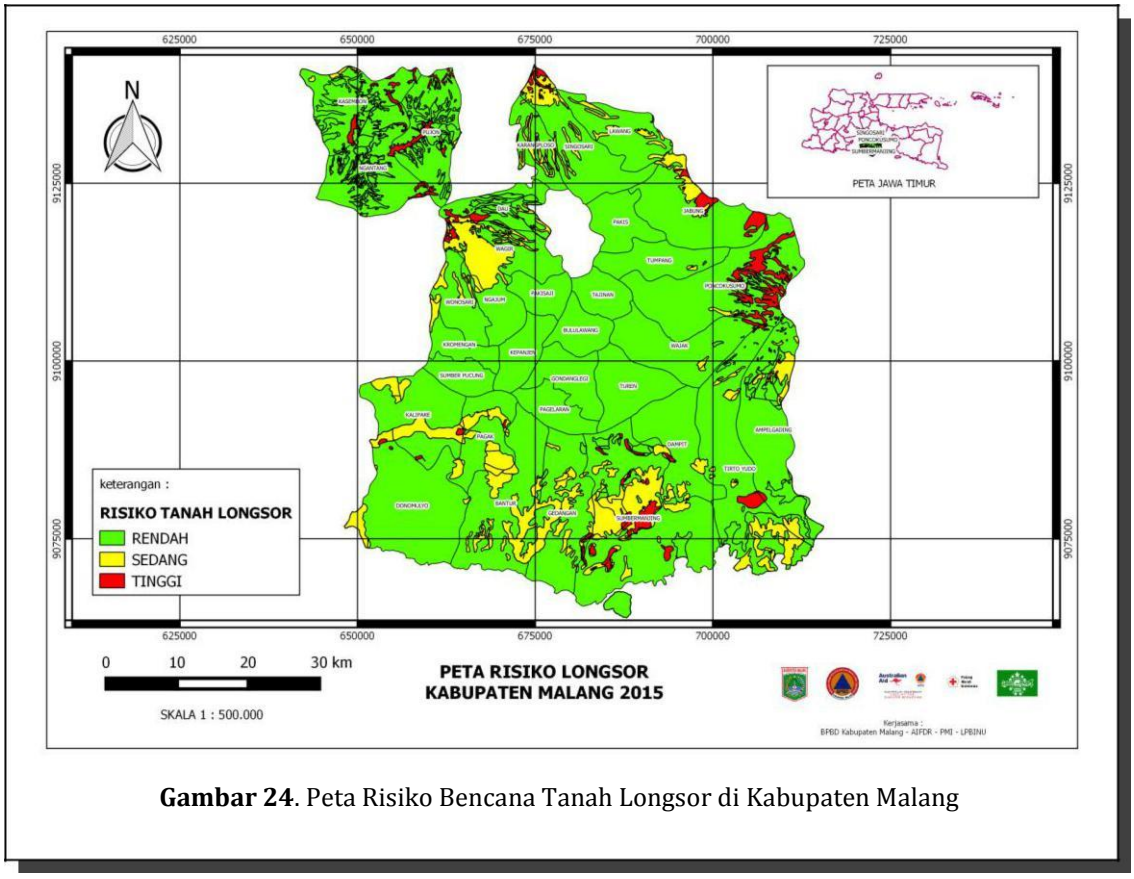
Gambar 22. Peta Risiko Bencana Cuaca Ekstrim di Kabupaten Malang



Gambar 23. Peta Potensi Risiko Puting Beliung di Kabupaten Malang

2.9 Longsor

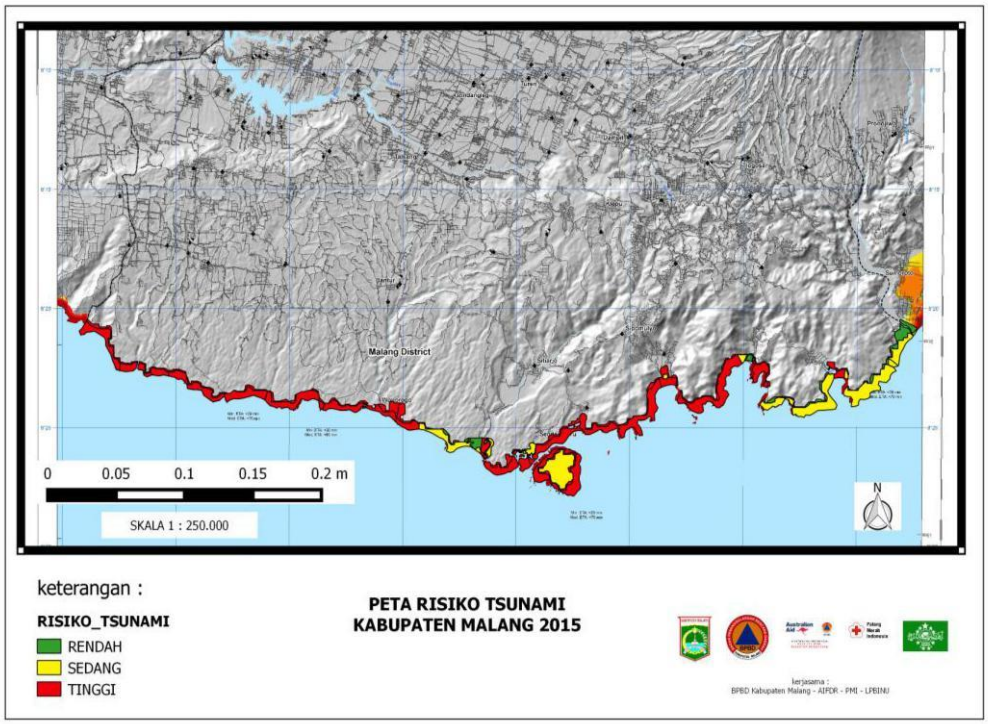
Risiko bencana longsor di Kabupaten Malang terbagi atas 3 tingkatan yaitu rendah, sedang dan tinggi; namun secara umum risiko bencana ini di wilayah Kabupaten Malang adalah Rendah .Tingkat risiko tinggi berada di wilayah di Kecamatan Sumbermanjing Wetan, Tirtoyudo, Poncokusumo, Pujon, Jabung, Ngantang, dan Kasembon



Gambar 24. Peta Risiko Bencana Tanah Longsor di Kabupaten Malang

2.10 Tsunami

Risiko bencana tsunami di Kabupaten Malang dikategorikan dalam tingkatan tinggi di wilayah selatan. Daerah dengan tingkat risiko tinggi ada di Kabupaten Malang yaitu di Kecamatan Ampel Gading, Tirtoyudo, Sumbermanjing Wetan, Gedangan, Bantur, dan Donomulyo.



Gambar 25. Peta Risiko Bencana Tsunami di Kabupaten Malang

2.11 Multi Resiko Bencana

Peta multi risiko dapat disusun berdasarkan ancaman bencana yang berpotensi di Kabupaten Malang. Selain itu, peta risiko juga dapat disusun berdasarkan multi ancaman yang dihasilkan berdasarkan penjumlahan dari indeks-indeks risiko masing-masing ancaman berdasarkan faktor-faktor pembobotan dari masing-masing ancaman. Gambaran tentang peta multi risiko di Kabupaten Malang dapat dilihat pada gambar di bawah ini.

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SURAT KETERANGAN

NOMOR : 072/33 /35.07.205/2018
Untuk melakukan Survey/Research/Penelitian/KKN/PKL/Magang

Menunjuk : Surat dari Dekan Fakultas Ilmu Administrasi Universitas Brawijaya Malang Nomor:18778/UN.10.F03.11.11/PN/2017 Tanggal:29 Desember 2017 Perihal:Ijin Rekomendasi Penelitian

Dengan ini Kami **TIDAK KEBERATAN** dilaksanakan **Ijin Penelitian** oleh:

Nama / Instansi	:	Sindi Destiasona Shalatdiningrum
Alamat	:	Jl MT.Haryono 163 Malang
Thema/Judul/Survey/Research	:	Strategi Pengurangan Risiko Bencana Badan Penanggulangan Bencana Daerah Kabupaten Malang
Daerah/tempat kegiatan	:	Di Badan Penaggulangan Bencana Daerah Kab.Malang
Lamanya	:	01 Januari - 09 Maret 2018
Pengikut	:	-

Dengan Ketentuan :
1. Mentaati Ketentuan - Ketentuan / Peraturan yang berlaku
2. Sesampainya ditempat supaya melapor kepada Pejabat Setempat
3. Setelah selesai mengadakan kegiatan harap segera melapor kembali ke Bupati Malang Cq. Kepala Badan Kesatuan Bangsa dan Politik Kabupaten Malang
4. Surat Keterangan ini tidak berlaku apabila tidak memenuhi ketentuan tersebut diatas

Malang, 04 Januari 2018
An. KEPALA BADAN KESBANG DAN POLITIK
Kepala Bidang Ideologi,HAM dan Wasbang

Kasubid Wawasan Kebangsaan

PEMERINTAH KABUPATEN MALANG
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2. Kepala Badan Penanggulangan Bencana Daerah Kab.Malang
3. Mhs/Ybs
4. Arsip

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072/454 /35.07.206/2018

Yang bertanda tangan dibawah ini :

Nama	:	Dra. ENDAH PARMININGTYAS, M.Si
NIP	:	19660522 199303 2 004
Jabatan	:	Sekretaris BPBD Kabupaten Malang

Menerangkan dengan sebenarnya bahwa :

Nama	:	SINDI DESTIASONA SHALATDININGRUM
NIM	:	145030101111135
Program Studi	:	Ilmu Administrasi Publik
Fakultas	:	Ilmu Administrasi Universitas Brawijaya Malang

Telah Melaksanakan Penelitian di Badan Penanggulangan Bencana Daerah Kabupaten Malang, mulai 01 Januari s/d 09 Maret 2018 sesuai dengan surat dari Badan Kesatuan Bangsa dan Politik Kabupaten Malang, Tanggal 04 Januari 2018, Nomor : 072/33/35.07.205/2018, Perihal : Ijin Penelitian.

Demikian Surat Keterangan ini dibuat untuk dipergunakan sebagaimana mestinya.

Kepanjen, 18 April 2018

a.n. KEPALA PELAKSANA BPBD
KABUPATEN MALANG
Sekretaris

PEMERINTAH KABUPATEN MALANG
BADAN PENANGGULANGAN BENCANA DAERAH

Dra. ENDAH PARMININGTYAS, M.Si
Pembina Tingkat I
NIP. 19660522 199303 2 004

SINDI

DESTIASONA SHALATDININGRUM

SINDIDS20@GMAIL.COM

LINKEDIN.COM/IN/SINDIDS

EDUCATION

PUBLIC ADMINISTRATION SCIENCE - BRAWIJAYA UNIVERSITY
2014 - 2018
Bachelor Degree with 3,62 GPA. International Class.

PUBLIC MANAGEMENT – UNIVERSITI UTARA MALAYSIA
2017
International Exchange Student.

SENIOR HIGH SCHOOL 4 SIDOARJO, EAST JAVA
2011 - 2014
Best 3 graduate.

JUNIOR HIGH SCHOOL 4 SIDOARJO, EAST JAVA
2008 - 2011

SIDOKUMPUL ELEMENTARY SCHOOL, SIDOARJO, EAST JAVA
2002 - 2008
Best 3 graduate.

MATARAM, DECEMBER 20TH 1995

PERUMAHAN VILLA JASMINE 1, SIDOARJO, EAST JAVA

SINDIDS

ACHIEVEMENT

FAVORITE FINALIST of South East Asia Government Forum 2018 • AWARDEE of Scholarship from Higher Education Ministry 2015 & 2017

ORGANIZATION

GENERAL SECRETARY | AKSI DAN KONTRIBUSI SOSIAL REMAJA (AKSARA) INDONESIA | 2016-2018

"Empowering youth to empower others". An organization that concern on youth leadership, public speaking and any kind of soft skills development.

HEAD OF SOCIAL DIVISION | STUDENT EXECUTIVE BOARD OF ADMINISTRATIVE SCIENCE FACULTY | 2016

Facilitate and improve social desire of student FIA UB to empower the community by held activities concern to environment, health, and community service activity.

STAFF OF EDUCATION DEPARTMENT | STUDENT ASSOCIATION OF PUBLIC ADMINISTRATION (HUMANISTIK) | 2016 and 2015

Facilitate student of public administration FIA UB to increase their academic skill by held activities of discussion, competition, workshop and seminar.

VOLUNTEER

ADMINISTRATOR SOCIAL MOVEMENT | Sumberpetung Village, Malang District | 2016

Help the underdeveloped village in economy and education.

BINA DESA HUMANISTIK | Princi Village, Malang District | 2016

Increase the economy activity through explore the commodity of village.

PERSONALITY

Open minded person who always enthusiast with new things.
Personally a happy soul and appreciate diversity.
Passionate in social activity and project management.

MOTTO

"You are what you think"

COMMITTEE

STEERING COMMITTEE | FROM TRASH TO GREEN | 2016

Social activity to reduce waste and planting trees.

CHIEF EXECUTIVE | WORKSHOP OF SCIENTIFIC PAPER | 2016

Develop skill of students to do research and write scientific papers.

EVENT CREW | ADIRAJA | 2015

FIA UB's new student orientation.

COORDINATOR OF LIAISON OFFICER | ADMINISTRATOR IN ACTION | 2015

National Panel Discussion held in FIA UB.

EXPERIENCE

REPRESENTATIVE | East Java Public Administration Student Conference | 2015

MODERATOR | Education Fair: National Essay Competition and Seminar | 2016

MODERATOR | School Of Social Movement | 2016

MASTER OF CEREMONY | ADIRAJA: New Student Orientation and Soft Skill Development | 2015